EXHIBIT G

US009326025B2

(12) **United States Patent**
Rao et al.

(10) **Patent No.: US 9,326,025 B2**
(45) **Date of Patent: *Apr. 26, 2016**

(54) **MEDIA CONTENT SEARCH RESULTS RANKED BY POPULARITY**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/915,411**

(22) Filed: **Jun. 11, 2013**

(65) **Prior Publication Data**

US 2013/0283306 A1 Oct. 24, 2013

Related U.S. Application Data

(63) Continuation of application No. 12/846,442, filed on Jul. 29, 2010, now Pat. No. 8,478,750, which is a continuation of application No. 11/716,236, filed on Mar. 9, 2007, now Pat. No. 7,801,888.

(51) **Int. Cl.**
G06F 17/30 (2006.01)
H04N 21/442 (2011.01)
(Continued)

(52) **U.S. Cl.**
CPC ***H04N 21/44204*** (2013.01); ***G06F 17/30696*** (2013.01); ***G06F 17/30867*** (2013.01); ***H04H 60/46*** (2013.01); ***H04N 5/44543*** (2013.01); ***H04N 7/17318*** (2013.01); ***H04N 21/252*** (2013.01); ***H04N 21/4661*** (2013.01); ***H04N 21/4828*** (2013.01)

(58) **Field of Classification Search**
CPC G06F 17/30867; G06F 17/3084; G06F 17/30696
USPC 707/722, 723, 727, 728, 748, 732, 749, 707/751–753
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,440,427 A 4/1969 Kammer
3,492,577 A 1/1970 Reiter et al.
(Continued)

FOREIGN PATENT DOCUMENTS

AU 5619898 A 7/1998
AU 731010 B2 3/2001
(Continued)

OTHER PUBLICATIONS

"Extended European Search Report", European Patent Application No. 08731092.6, (May 29, 2012), 9 pages.
(Continued)

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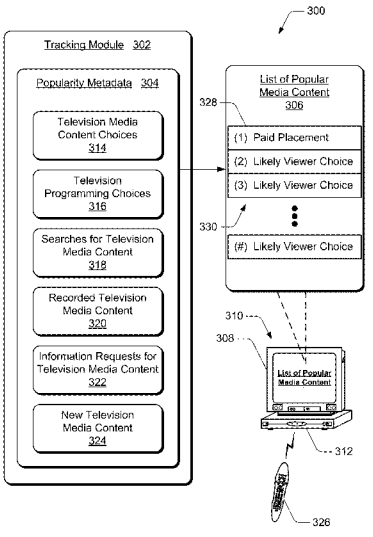
(57) **ABSTRACT**

Media content search results ranked by popularity is described. In embodiment(s), a search request for television media content can be initiated by a viewer, and television media content that is relevant to the search request can be identified. The relevant television media content can then be ranked based on a popularity rating and the relevant television media content can be displayed in an ordered list that is ordered by popularity rankings.

40 Claims, 7 Drawing Sheets



(51) **Int. Cl.**

H04H 60/46	(2008.01)
H04N 5/445	(2011.01)
H04N 7/173	(2011.01)
H04N 21/25	(2011.01)
H04N 21/466	(2011.01)
H04N 21/482	(2011.01)

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,493,674	A	2/1970	Houghton
3,729,581	A	4/1973	Anderson
3,833,757	A	9/1974	Kirk, Jr. et al.
3,891,792	A	6/1975	Kimura
3,936,868	A	2/1976	Thorpe
3,996,583	A	12/1976	Hutt et al.
4,004,085	A	1/1977	Makino et al.
4,016,361	A	4/1977	Pandey
4,024,401	A	5/1977	Bernstein et al.
4,026,555	A	5/1977	Kirschner et al.
4,031,548	A	6/1977	Kato et al.
4,052,719	A	10/1977	Hutt et al.
4,058,830	A	11/1977	Guinet et al.
4,070,693	A	1/1978	Shutterly
4,079,419	A	3/1978	Siegle et al.
4,081,753	A	3/1978	Miller
4,081,754	A	3/1978	Jackson
4,096,524	A	6/1978	Scott
4,103,524	A	8/1978	Mitchell et al.
4,107,735	A	8/1978	Frohbach
4,134,127	A	1/1979	Campioni
4,139,860	A	2/1979	Micic et al.
4,150,254	A	4/1979	Schussler et al.
4,156,850	A	5/1979	Beyers, Jr.
4,161,728	A	7/1979	Insam
4,162,513	A	7/1979	Beyers, Jr. et al.
4,170,782	A	10/1979	Miller
4,186,413	A	1/1980	Mortimer
4,189,781	A	2/1980	Douglas
4,193,120	A	3/1980	Yello
4,203,130	A	5/1980	Doumit et al.
4,205,343	A	5/1980	Barrett
4,206,483	A	6/1980	Nakamura
4,218,698	A	8/1980	Bart et al.
4,228,543	A	10/1980	Jackson
4,231,031	A	10/1980	Crowther et al.
4,233,628	A	11/1980	Ciciora
4,249,211	A	2/1981	Baba et al.
4,249,213	A	2/1981	Imaide et al.
4,261,006	A	4/1981	Weintraub et al.
4,264,924	A	4/1981	Freeman
4,264,925	A	4/1981	Freeman et al.
4,267,563	A	5/1981	Sato et al.
4,270,145	A	5/1981	Farina
4,271,532	A	6/1981	Wine
4,276,597	A	6/1981	Dissly et al.
4,280,148	A	7/1981	Saxena
4,283,787	A	8/1981	Chambers
4,288,809	A	9/1981	Yabe
4,290,142	A	9/1981	Schnee et al.
4,300,040	A	11/1981	Gould et al.
4,305,101	A	12/1981	Yarbrough et al.
4,310,924	A	1/1982	Miyasaka et al.
4,325,081	A	4/1982	Abe et al.
4,329,684	A	5/1982	Monteath et al.
4,331,974	A	5/1982	Cogswell et al.
4,334,242	A	6/1982	Mangold
4,337,480	A	6/1982	Bourassin et al.
4,337,482	A	6/1982	Coutta
4,337,483	A	6/1982	Guillou
4,344,090	A	8/1982	Belisomi et al.
4,355,415	A	10/1982	George et al.
4,367,557	A	1/1983	Stern et al.
4,367,559	A	1/1983	Tults
4,375,651	A	3/1983	Templin et al.
4,381,522	A	4/1983	Lambert
4,385,210	A	5/1983	Marquiss
4,388,645	A	6/1983	Cox et al.
4,390,901	A	6/1983	Keiser
4,393,376	A	7/1983	Thomas
4,403,285	A	9/1983	Kikuchi
4,405,946	A	9/1983	Knight
4,412,244	A	10/1983	Shanley, II
4,413,281	A	11/1983	Thonnart
4,420,769	A	12/1983	Novak
4,425,579	A	1/1984	Merrell
4,425,581	A	1/1984	Schweppe et al.
4,429,385	A	1/1984	Cichelli et al.
4,435,842	A	3/1984	Mayumi et al.
4,439,784	A	3/1984	Furukawa et al.
4,449,249	A	5/1984	Price
4,456,925	A	6/1984	Skerlos et al.
4,466,017	A	8/1984	Banker
4,475,153	A	10/1984	Kihara et al.
4,477,830	A	10/1984	Lindman et al.
4,488,179	A	12/1984	Krüger et al.
4,495,654	A	1/1985	Deiss
4,496,171	A	1/1985	Cherry
4,496,804	A	1/1985	Hung
4,496,976	A	1/1985	Swanson et al.
4,510,623	A	4/1985	Bonneau et al.
4,519,003	A	5/1985	Scholz
4,520,404	A	5/1985	Von Kohorn
4,523,228	A	6/1985	Banker
4,527,194	A	7/1985	Sirazi
4,531,020	A	7/1985	Wechselberger et al.
4,533,910	A	8/1985	Sukonick et al.
4,536,791	A	8/1985	Campbell et al.
4,547,804	A	10/1985	Greenberg
4,554,584	A	11/1985	Elam et al.
4,555,755	A	11/1985	Kurosawa et al.
4,555,775	A	11/1985	Pike
4,566,034	A	1/1986	Harger et al.
4,573,072	A	2/1986	Freeman
4,587,520	A	5/1986	Astle
4,593,414	A	6/1986	Koyanagi
4,595,951	A	6/1986	Filliman
4,595,952	A	6/1986	Filliman
4,598,288	A	7/1986	Yarbrough et al.
4,602,279	A	7/1986	Freeman
4,605,964	A	8/1986	Chard
4,605,973	A	8/1986	Von Kohorn
4,608,859	A	9/1986	Rockley
4,611,269	A	9/1986	Suzuki et al.
4,620,229	A	10/1986	Amano et al.
4,621,259	A	11/1986	Schepers et al.
4,622,545	A	11/1986	Atkinson
4,625,080	A	11/1986	Scott
4,631,601	A	12/1986	Brugliera et al.
4,635,109	A	1/1987	Comeau
4,635,121	A	1/1987	Hoffman et al.
4,641,205	A	2/1987	Beyers, Jr.
4,645,873	A	2/1987	Chomet
4,677,466	A	6/1987	Lert, Jr. et al.
4,677,501	A	6/1987	Saltzman et al.
4,685,131	A	8/1987	Horne
4,689,022	A	8/1987	Peers et al.
4,691,351	A	9/1987	Hayashi et al.
4,694,490	A	9/1987	Harvey et al.
4,701,794	A	10/1987	Froling et al.
4,704,725	A	11/1987	Harvey et al.
4,706,121	A	11/1987	Young
4,712,105	A	12/1987	Kohler
4,714,919	A	12/1987	Foster
4,718,107	A	1/1988	Hayes
RE32,632	E	3/1988	Atkinson
4,729,027	A	3/1988	Hakamada et al.
4,729,028	A	3/1988	Micic et al.
4,734,769	A	3/1988	Davis
4,745,549	A	5/1988	Hashimoto
4,746,983	A	5/1988	Hakamada
4,748,618	A	5/1988	Brown et al.
4,750,036	A	6/1988	Martinez
4,750,213	A	6/1988	Novak

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,751,578	A	6/1988	Reiter et al.
4,754,326	A	6/1988	Kram et al.
4,755,883	A	7/1988	Uehira
4,761,684	A	8/1988	Clark et al.
4,768,228	A	8/1988	Clupper et al.
4,772,882	A	9/1988	Mical
4,775,935	A	10/1988	Yourick
4,785,408	A	11/1988	Britton et al.
4,787,063	A	11/1988	Muguet
4,812,834	A	3/1989	Wells
4,814,883	A	3/1989	Perine et al.
4,821,102	A	4/1989	Ichikawa et al.
4,821,211	A	4/1989	Torres
4,829,558	A	5/1989	Welsh
4,832,373	A	5/1989	Swan
4,833,710	A	5/1989	Hirashima
4,843,482	A	6/1989	Hegendorfer
4,847,604	A	7/1989	Doyle
4,847,698	A	7/1989	Freeman
4,847,699	A	7/1989	Freeman
4,847,700	A	7/1989	Freeman
4,847,744	A	7/1989	Araki
4,855,813	A	8/1989	Russell et al.
4,857,999	A	8/1989	Welsh
4,862,268	A	8/1989	Campbell et al.
4,864,429	A	9/1989	Eigeldinger et al.
4,866,258	A	9/1989	Ueda et al.
4,866,542	A	9/1989	Shimada et al.
4,873,584	A	10/1989	Hashimoto
4,873,623	A	10/1989	Lane et al.
4,876,600	A	10/1989	Pietzsch et al.
4,879,611	A	11/1989	Fukui et al.
4,882,732	A	11/1989	Kaminaga
4,884,223	A	11/1989	Ingle et al.
4,885,579	A	12/1989	Sandbank
4,887,152	A	12/1989	Matsuzaki et al.
4,888,796	A	12/1989	Olivo, Jr.
4,890,168	A	12/1989	Inoue et al.
4,890,320	A	12/1989	Monslow et al.
4,890,321	A	12/1989	Seth-Smith et al.
4,894,789	A	1/1990	Yee
4,899,136	A	2/1990	Beard et al.
4,899,139	A	2/1990	Ishimochi et al.
4,899,370	A	2/1990	Kameo et al.
4,905,094	A	2/1990	Pocock et al.
4,908,707	A	3/1990	Kinghorn
4,908,713	A	3/1990	Levine
4,908,859	A	3/1990	Bennett et al.
4,914,517	A	4/1990	Duffield
4,914,732	A	4/1990	Henderson et al.
4,918,531	A	4/1990	Johnson
4,930,158	A	5/1990	Vogel
4,930,160	A	5/1990	Vogel
4,931,783	A	6/1990	Atkinson
4,935,865	A	6/1990	Rowe et al.
4,937,821	A	6/1990	Boulton
4,937,863	A	6/1990	Robert et al.
4,939,507	A	7/1990	Beard et al.
4,942,391	A	7/1990	Kikuta
4,945,563	A	7/1990	Horton et al.
4,954,882	A	9/1990	Kamemoto
4,959,719	A	9/1990	Strubbe et al.
4,959,720	A	9/1990	Duffield et al.
4,963,994	A	10/1990	Levine
4,965,825	A	10/1990	Harvey et al.
4,977,455	A	12/1990	Young
4,987,486	A	1/1991	Johnson et al.
4,991,011	A	2/1991	Johnson et al.
4,991,012	A	2/1991	Yoshino
4,992,782	A	2/1991	Sakamoto et al.
4,992,940	A	2/1991	Dworkin
4,995,078	A	2/1991	Monslow et al.
4,996,642	A	2/1991	Hey
4,998,171	A	3/1991	Kim et al.
5,003,384	A	3/1991	Durden et al.
5,005,084	A	4/1991	Skinner
5,008,853	A	4/1991	Bly et al.
5,012,409	A	4/1991	Fletcher et al.
5,014,125	A	5/1991	Pocock et al.
5,016,273	A	5/1991	Hoff
5,023,721	A	6/1991	Moon-Hwan
5,027,400	A	6/1991	Baji et al.
5,031,045	A	7/1991	Kawasaki
5,036,314	A	7/1991	Barillari et al.
5,038,211	A	8/1991	Hallenbeck
5,040,067	A	8/1991	Yamazaki
5,045,947	A	9/1991	Beery
5,046,092	A	9/1991	Walker et al.
5,047,867	A	9/1991	Strubbe et al.
5,058,160	A	10/1991	Banker et al.
5,062,060	A	10/1991	Kolnick
5,068,733	A	11/1991	Bennett
5,068,734	A	11/1991	Beery
5,072,412	A	12/1991	Henderson, Jr. et al.
5,075,771	A	12/1991	Hashimoto
5,083,205	A	1/1992	Arai
5,083,800	A	1/1992	Lockton
5,089,885	A	2/1992	Clark
5,090,049	A	2/1992	Chen
5,091,785	A	2/1992	Canfield et al.
5,093,718	A	3/1992	Hoarty et al.
5,093,921	A	3/1992	Bevins, Jr.
5,099,319	A	3/1992	Esch et al.
5,103,314	A	4/1992	Keenan
5,105,184	A	4/1992	Pirani et al.
5,109,279	A	4/1992	Ando
5,109,414	A	4/1992	Harvey et al.
5,113,259	A	5/1992	Romesburg et al.
5,119,188	A	6/1992	McCalley et al.
5,119,577	A	6/1992	Lilly
5,121,476	A	6/1992	Yee
5,123,046	A	6/1992	Levine
5,126,851	A	6/1992	Yoshimura et al.
5,128,766	A	7/1992	Choi
5,132,992	A	7/1992	Yurt et al.
5,134,719	A	7/1992	Mankovitz
5,146,335	A	9/1992	Kim et al.
5,148,154	A	9/1992	MacKay et al.
5,148,275	A	9/1992	Blatter et al.
5,151,782	A	9/1992	Ferraro
5,151,789	A	9/1992	Young
5,152,012	A	9/1992	Schwob
5,155,591	A	10/1992	Wachob
5,155,806	A	10/1992	Hoeber et al.
5,157,768	A	10/1992	Hoeber et al.
5,161,019	A	11/1992	Emanuel
5,161,023	A	11/1992	Keenan
5,162,905	A	11/1992	Itoh et al.
5,170,388	A	12/1992	Endoh
5,172,111	A	12/1992	Olivo, Jr.
5,172,413	A	12/1992	Bradley et al.
5,177,604	A	1/1993	Martinez
5,179,439	A	1/1993	Hashimoto et al.
5,179,654	A	1/1993	Richards et al.
5,182,646	A	1/1993	Keenan
5,187,589	A	2/1993	Kono et al.
5,189,630	A	2/1993	Barstow et al.
5,191,423	A	3/1993	Yoshida et al.
5,194,941	A	3/1993	Grimaldi et al.
5,195,092	A	3/1993	Wilson et al.
5,195,134	A	3/1993	Inoue et al.
5,200,822	A	4/1993	Bronfin et al.
5,200,823	A	4/1993	Yoneda et al.
5,204,897	A	4/1993	Wyman
5,206,722	A	4/1993	Kwan
5,210,611	A	5/1993	Yee et al.
5,212,553	A	5/1993	Maruoka
5,214,622	A	5/1993	Nemoto et al.
5,216,515	A	6/1993	Steele et al.
5,220,420	A	6/1993	Hoarty et al.
5,223,924	A	6/1993	Strubbe
5,227,874	A	7/1993	Von Kohorn
5,231,493	A	7/1993	Apitz
5,231,494	A	7/1993	Wachob

(56) **References Cited**

U.S. PATENT DOCUMENTS

RE34,340	E	8/1993	Freeman
5,233,423	A	8/1993	Jernigan et al.
5,233,654	A	8/1993	Harvey et al.
5,235,415	A	8/1993	Bonicel et al.
5,236,199	A	8/1993	Thompson, Jr.
5,237,411	A	8/1993	Fink et al.
5,237,417	A	8/1993	Hayashi et al.
5,237,418	A	8/1993	Kaneko
5,239,540	A	8/1993	Rovira et al.
5,241,428	A	8/1993	Goldwasser et al.
5,245,420	A	9/1993	Harney et al.
5,247,347	A	9/1993	Litteral et al.
5,247,364	A	9/1993	Banker et al.
5,247,580	A	9/1993	Kimura et al.
5,249,043	A	9/1993	Grandmougin et al.
5,251,921	A	10/1993	Daniels
5,252,860	A	10/1993	McCarty et al.
5,253,066	A	10/1993	Vogel
5,253,067	A	10/1993	Chaney et al.
5,260,778	A	11/1993	Kauffman et al.
5,260,788	A	11/1993	Takano et al.
5,260,999	A	11/1993	Wyman
5,262,860	A	11/1993	Fitzpatrick et al.
5,283,561	A	2/1994	Lumelsky et al.
5,283,639	A	2/1994	Esch et al.
5,283,819	A	2/1994	Glick et al.
5,285,265	A	2/1994	Choi et al.
5,285,278	A	2/1994	Holman
5,285,284	A	2/1994	Takashima et al.
5,293,357	A	3/1994	Hallenbeck
5,295,242	A	3/1994	Mashruwala et al.
5,296,931	A	3/1994	Na et al.
5,297,204	A	3/1994	Levine
5,299,006	A	3/1994	Kim et al.
5,301,028	A	4/1994	Banker et al.
5,307,173	A	4/1994	Yuen et al.
5,311,423	A	5/1994	Clark
5,313,282	A	5/1994	Hayashi
5,315,392	A	5/1994	Ishikawa et al.
5,317,391	A	5/1994	Banker et al.
5,317,403	A	5/1994	Keenan
5,319,445	A	6/1994	Fitts
5,323,234	A	6/1994	Kawasaki
5,323,240	A	6/1994	Amano et al.
5,325,183	A	6/1994	Rhee
5,325,423	A	6/1994	Lewis
5,335,277	A	8/1994	Harvey et al.
5,339,434	A	8/1994	Rusis
5,341,350	A	8/1994	Frank et al.
5,343,239	A	8/1994	Lappington et al.
5,345,430	A	9/1994	Moe
5,347,167	A	9/1994	Singh
5,347,632	A	9/1994	Filepp et al.
5,351,075	A	9/1994	Herz et al.
5,353,121	A	10/1994	Young et al.
5,355,162	A	10/1994	Yazolino et al.
5,357,276	A	10/1994	Banker et al.
5,359,367	A	10/1994	Stockill
5,359,601	A	10/1994	Wasilewski et al.
5,361,091	A	11/1994	Hoarty et al.
5,365,282	A	11/1994	Levine
5,367,316	A	11/1994	Ikezaki
5,367,330	A	11/1994	Haave et al.
5,371,551	A	12/1994	Logan et al.
5,373,288	A	12/1994	Blahut
5,374,942	A	12/1994	Gilligan et al.
5,374,951	A	12/1994	Welsh
5,377,317	A	12/1994	Bates et al.
5,377,319	A	12/1994	Kitahara et al.
5,382,970	A	1/1995	Kiefl
5,382,983	A	1/1995	Kwoh et al.
5,384,910	A	1/1995	Torres
5,387,945	A	2/1995	Takeuchi
5,389,964	A	2/1995	Oberle et al.
5,390,027	A	2/1995	Henmi et al.
5,396,546	A	3/1995	Remillard
5,398,074	A	3/1995	Duffield et al.
5,398,138	A	3/1995	Tomita
5,404,393	A	4/1995	Remillard
5,404,567	A	4/1995	DePietro et al.
5,410,326	A	4/1995	Goldstein
5,410,343	A	4/1995	Coddington et al.
5,410,344	A	4/1995	Graves et al.
5,410,367	A	4/1995	Zahavi et al.
5,412,720	A	5/1995	Hoarty
5,414,756	A	5/1995	Levine
5,416,508	A	5/1995	Sakuma et al.
5,422,389	A	6/1995	Trepka et al.
5,424,770	A	6/1995	Schmelzer et al.
5,425,101	A	6/1995	Woo et al.
5,426,699	A	6/1995	Wunderlich et al.
5,428,406	A	6/1995	Terasawa
5,432,561	A	7/1995	Strubbe
5,434,625	A	7/1995	Willis
5,434,626	A	7/1995	Hayashi et al.
5,434,678	A	7/1995	Abecassis
5,436,676	A	7/1995	Pint et al.
5,438,355	A	8/1995	Palmer
5,438,372	A	8/1995	Tsumori et al.
5,438,423	A	8/1995	Lynch et al.
5,440,678	A	8/1995	Eisen et al.
5,442,389	A	8/1995	Blahut et al.
5,444,499	A	8/1995	Saitoh
5,446,919	A	8/1995	Wilkins
5,452,012	A	9/1995	Saitoh
5,453,146	A	9/1995	Kemper
5,453,796	A	9/1995	Duffield et al.
5,455,570	A	10/1995	Cook et al.
5,457,478	A	10/1995	Frank
5,459,522	A	10/1995	Pint
5,461,415	A	10/1995	Wolf et al.
5,465,113	A	11/1995	Gilboy
5,465,385	A	11/1995	Ohga et al.
5,468,948	A	11/1995	Koenck et al.
5,469,206	A	11/1995	Strubbe et al.
5,473,442	A	12/1995	Kim et al.
5,477,262	A	12/1995	Banker et al.
5,479,266	A	12/1995	Young et al.
5,479,268	A	12/1995	Young et al.
5,479,302	A	12/1995	Haines
5,479,497	A	12/1995	Kovarik
5,481,296	A	1/1996	Cragun et al.
5,483,278	A	1/1996	Strubbe et al.
5,485,197	A	1/1996	Hoarty
5,485,219	A	1/1996	Woo
5,485,221	A	1/1996	Banker et al.
5,485,518	A	1/1996	Hunter et al.
5,488,409	A	1/1996	Yuen et al.
5,495,295	A	2/1996	Long
5,502,504	A	3/1996	Marshall et al.
5,515,098	A	5/1996	Carles
5,515,106	A	5/1996	Chaney et al.
5,515,511	A	5/1996	Nguyen et al.
5,517,254	A	5/1996	Monta et al.
5,517,256	A	5/1996	Hashimoto
5,517,257	A	5/1996	Dunn et al.
5,521,589	A	5/1996	Mondrosch et al.
5,523,791	A	6/1996	Berman
5,523,794	A	6/1996	Mankovitz et al.
5,523,795	A	6/1996	Ueda
5,523,796	A	6/1996	Marshall et al.
5,524,195	A	6/1996	Clanton, III et al.
5,524,271	A	6/1996	Hollmann et al.
5,525,795	A	6/1996	MacGregor et al.
5,526,034	A	6/1996	Hoarty et al.
5,526,035	A	6/1996	Lappington et al.
5,526,257	A	6/1996	Lerner
5,527,257	A	6/1996	Piramoon
5,528,304	A	6/1996	Cherrick et al.
5,532,735	A	7/1996	Blahut et al.
5,532,754	A	7/1996	Young et al.
5,534,911	A	7/1996	Levitan
5,537,141	A	7/1996	Harper et al.
5,539,449	A	7/1996	Blahut et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,539,479	A	7/1996	Bertram
5,539,822	A	7/1996	Lett
5,539,880	A	7/1996	Lakhani
5,541,662	A	7/1996	Adams et al.
5,541,738	A	7/1996	Mankovitz
5,543,929	A	8/1996	Mankovitz et al.
5,543,933	A	8/1996	Kang et al.
5,544,321	A	8/1996	Theimer et al.
5,546,521	A	8/1996	Martinez
5,548,338	A	8/1996	Ellis et al.
5,548,345	A	8/1996	Brian et al.
5,550,576	A	8/1996	Klosterman
5,550,578	A	8/1996	Hoarty et al.
5,550,825	A	8/1996	McMullan, Jr. et al.
5,550,863	A	8/1996	Yurt et al.
5,553,221	A	9/1996	Reimer et al.
5,557,338	A	9/1996	Maze et al.
5,557,721	A	9/1996	Fite et al.
5,557,724	A	9/1996	Sampat et al.
5,559,548	A	9/1996	Davis et al.
5,559,549	A	9/1996	Hendricks et al.
5,559,550	A	9/1996	Mankovitz
5,559,942	A	9/1996	Gough et al.
5,559,949	A	9/1996	Reimer et al.
5,561,471	A	10/1996	Kim
5,561,709	A	10/1996	Remillard
5,563,665	A	10/1996	Chang
5,568,272	A	10/1996	Levine
5,570,295	A	10/1996	Isenberg et al.
5,572,442	A	11/1996	Schulhof et al.
5,574,778	A	11/1996	Ely et al.
5,574,962	A	11/1996	Fardeau et al.
5,576,755	A	11/1996	Davis et al.
5,576,951	A	11/1996	Lockwood
5,579,055	A	11/1996	Hamilton et al.
5,579,239	A	11/1996	Freeman et al.
5,581,479	A	12/1996	McLaughlin et al.
5,582,364	A	12/1996	Trulin et al.
5,583,560	A	12/1996	Florin et al.
5,583,561	A	12/1996	Baker et al.
5,583,563	A	12/1996	Wanderscheid et al.
5,583,576	A	12/1996	Perlman et al.
5,583,653	A	12/1996	Timmermans et al.
5,584,025	A	12/1996	Keithley et al.
5,585,838	A	12/1996	Lawler et al.
5,585,858	A	12/1996	Harper et al.
5,585,865	A	12/1996	Amano et al.
5,585,866	A	12/1996	Miller et al.
5,589,892	A	12/1996	Knee et al.
5,592,551	A	1/1997	Lett et al.
5,592,571	A	1/1997	Peters
5,594,490	A	1/1997	Dawson et al.
5,594,491	A	1/1997	Hodge et al.
5,594,492	A	1/1997	O'Callaghan et al.
5,594,507	A	1/1997	Hoarty
5,594,509	A	1/1997	Florin et al.
5,594,661	A	1/1997	Bruner et al.
5,594,779	A	1/1997	Goodman
5,595,865	A	1/1997	Possanza et al.
5,596,373	A	1/1997	White et al.
5,596,705	A	1/1997	Reimer et al.
5,598,523	A	1/1997	Fujita
5,600,364	A	2/1997	Hendricks et al.
5,600,365	A	2/1997	Kondo et al.
5,600,366	A	2/1997	Schulman
5,600,573	A	2/1997	Hendricks et al.
5,602,582	A	2/1997	Wanderscheid et al.
5,602,596	A	2/1997	Claussen et al.
5,602,597	A	2/1997	Bertram
5,602,598	A	2/1997	Shintani
5,602,600	A	2/1997	Queinnec
5,604,542	A	2/1997	Dedrick
5,606,374	A	2/1997	Bertram
5,606,642	A	2/1997	Stautner et al.
5,608,448	A	3/1997	Smoral et al.
5,610,653	A	3/1997	Abecassis
5,610,664	A	3/1997	Bobert
5,616,876	A	4/1997	Cluts
5,617,526	A	4/1997	Oran et al.
5,617,565	A	4/1997	Augenbraun et al.
5,619,247	A	4/1997	Russo
5,619,249	A	4/1997	Billock et al.
5,619,274	A	4/1997	Roop et al.
5,621,456	A	4/1997	Florin et al.
5,621,579	A	4/1997	Yuen
5,623,613	A	4/1997	Rowe et al.
5,625,406	A	4/1997	Newberry et al.
5,625,464	A	4/1997	Compoint et al.
5,625,678	A	4/1997	Blomfield-Brown
5,625,693	A	4/1997	Rohatgi et al.
5,627,940	A	5/1997	Rohra et al.
5,629,733	A	5/1997	Youman et al.
5,629,867	A	5/1997	Goldman
5,630,119	A	5/1997	Aristides et al.
5,631,995	A	5/1997	Weissensteiner et al.
5,632,007	A	5/1997	Freeman
5,633,683	A	5/1997	Rosengren et al.
5,634,051	A	5/1997	Thomson
5,635,978	A	6/1997	Alten et al.
5,635,979	A	6/1997	Kostreski et al.
5,635,987	A	6/1997	Park et al.
5,635,989	A	6/1997	Rothmuller
5,636,346	A	6/1997	Saxe
5,638,522	A	6/1997	Dunsmuir et al.
5,640,002	A	6/1997	Ruppert et al.
5,640,484	A	6/1997	Mankovitz
5,640,501	A	6/1997	Turpin
5,640,577	A	6/1997	Scharmer
5,642,153	A	6/1997	Chaney et al.
5,648,813	A	7/1997	Tanigawa et al.
5,648,824	A	7/1997	Dunn et al.
5,650,826	A	7/1997	Eitz
5,650,831	A	7/1997	Farwell
5,651,129	A	7/1997	Yokote et al.
5,652,613	A	7/1997	Lazarus et al.
5,652,615	A	7/1997	Bryant et al.
5,654,748	A	8/1997	Matthews, III
5,654,886	A	8/1997	Zereski, Jr. et al.
5,657,072	A	8/1997	Aristides et al.
5,657,091	A	8/1997	Bertram
5,657,414	A	8/1997	Lett et al.
5,659,350	A	8/1997	Hendricks et al.
5,659,366	A	8/1997	Kerman
5,659,367	A	8/1997	Yuen
5,659,742	A	8/1997	Beattie et al.
5,661,516	A	8/1997	Carles
5,661,517	A	8/1997	Budow et al.
5,663,757	A	9/1997	Morales
5,664,111	A	9/1997	Nahan et al.
5,666,293	A	9/1997	Metz et al.
5,666,498	A	9/1997	Amro
5,666,645	A	9/1997	Thomas et al.
5,671,276	A	9/1997	Eyer et al.
5,671,411	A	9/1997	Watts et al.
5,671,607	A	9/1997	Clemens et al.
5,675,390	A	10/1997	Schindler et al.
5,675,743	A	10/1997	Mavity
5,675,752	A	10/1997	Scott et al.
5,677,708	A	10/1997	Matthews, III et al.
5,677,981	A	10/1997	Kato et al.
5,682,195	A	10/1997	Hendricks et al.
5,682,196	A	10/1997	Freeman
5,682,206	A	10/1997	Wehmeyer et al.
5,682,525	A	10/1997	Bouve et al.
5,684,525	A	11/1997	Klosterman
5,686,954	A	11/1997	Yoshinobu et al.
5,687,331	A	11/1997	Volk et al.
5,689,648	A	11/1997	Diaz et al.
5,689,663	A	11/1997	Williams
5,689,666	A	11/1997	Berquist et al.
5,691,476	A	11/1997	Madaras
5,692,214	A	11/1997	Levine
5,692,335	A	12/1997	Magnuson
5,694,163	A	12/1997	Harrison

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,694,176 A 12/1997 Bruette et al.
5,694,381 A 12/1997 Sako
5,696,765 A 12/1997 Safadi
5,696,905 A 12/1997 Reimer et al.
5,699,052 A 12/1997 Miyahara
5,699,107 A 12/1997 Lawler et al.
5,699,125 A 12/1997 Rzeszewski et al.
5,699,528 A 12/1997 Hogan
5,701,383 A 12/1997 Russo et al.
5,703,604 A 12/1997 McCutchen
5,708,478 A 1/1998 Tognazzini
5,708,767 A 1/1998 Yeo et al.
5,708,780 A 1/1998 Levergood et al.
5,708,961 A 1/1998 Hylton et al.
5,710,601 A 1/1998 Marshall et al.
5,710,815 A 1/1998 Ming et al.
5,710,884 A 1/1998 Dedrick
5,715,314 A 2/1998 Payne et al.
5,715,399 A 2/1998 Bezos
5,717,452 A 2/1998 Janin et al.
5,717,923 A 2/1998 Dedrick
5,721,829 A 2/1998 Dunn et al.
5,722,041 A 2/1998 Freadman
5,724,091 A 3/1998 Freeman et al.
5,724,103 A 3/1998 Batchelor
5,724,521 A 3/1998 Dedrick
5,724,525 A 3/1998 Beyers, II et al.
5,724,567 A 3/1998 Rose et al.
5,726,702 A 3/1998 Hamaguchi et al.
5,727,060 A 3/1998 Young
5,727,163 A 3/1998 Bezos
5,731,844 A 3/1998 Rauch et al.
5,732,216 A 3/1998 Logan et al.
5,734,119 A 3/1998 France et al.
5,734,444 A 3/1998 Yoshinobu
5,734,720 A 3/1998 Salganicoff
5,734,853 A 3/1998 Hendricks et al.
5,734,893 A 3/1998 Li et al.
5,737,028 A 4/1998 Bertram et al.
5,737,029 A 4/1998 Ohkura et al.
5,737,030 A 4/1998 Hong et al.
5,737,552 A 4/1998 Lavallee et al.
5,740,231 A 4/1998 Cohn et al.
5,740,549 A 4/1998 Reilly et al.
5,742,443 A 4/1998 Tsao et al.
5,742,816 A 4/1998 Barr et al.
5,745,710 A 4/1998 Clanton, III et al.
5,748,191 A 5/1998 Rozak et al.
5,748,716 A 5/1998 Levine
5,749,043 A 5/1998 Worthy
5,749,081 A 5/1998 Whiteis
5,751,282 A 5/1998 Girard et al.
5,752,159 A 5/1998 Faust et al.
5,752,160 A 5/1998 Dunn
5,754,258 A 5/1998 Hanaya et al.
5,754,771 A 5/1998 Epperson et al.
5,754,939 A 5/1998 Herz et al.
5,757,417 A 5/1998 Aras et al.
5,758,257 A 5/1998 Herz et al.
5,758,258 A 5/1998 Shoff et al.
5,758,259 A 5/1998 Lawler
5,760,821 A 6/1998 Ellis et al.
5,761,372 A 6/1998 Yoshinobu et al.
5,761,601 A 6/1998 Nemirofsky et al.
5,761,606 A 6/1998 Wolzien
5,761,607 A 6/1998 Gudesen et al.
5,768,528 A 6/1998 Stumm
5,771,354 A 6/1998 Crawford
5,774,170 A 6/1998 Hite et al.
5,774,357 A 6/1998 Hoffberg et al.
5,774,534 A 6/1998 Mayer
5,774,664 A 6/1998 Hidary et al.
5,774,666 A 6/1998 Portuesi
5,774,859 A 6/1998 Houser et al.
5,774,887 A 6/1998 Wolff et al.
5,778,181 A 7/1998 Hidary et al.
5,778,182 A 7/1998 Cathey et al.
5,778,187 A 7/1998 Monteiro et al.
5,781,226 A 7/1998 Sheehan
5,781,227 A 7/1998 Goode et al.
5,781,228 A 7/1998 Sposato
5,781,245 A 7/1998 Van Der Weij et al.
5,781,246 A 7/1998 Alten et al.
5,781,734 A 7/1998 Ohno et al.
5,784,258 A 7/1998 Quinn
5,787,259 A 7/1998 Haroun et al.
5,788,507 A 8/1998 Redford et al.
5,790,198 A 8/1998 Roop et al.
5,790,201 A 8/1998 Antos
5,790,202 A 8/1998 Kummer et al.
5,790,423 A 8/1998 Lau et al.
5,790,426 A 8/1998 Robinson
5,790,753 A 8/1998 Krishnamoorthy et al.
5,790,835 A 8/1998 Case et al.
5,790,935 A 8/1998 Payton
5,790,952 A 8/1998 Seazholtz et al.
5,793,364 A 8/1998 Bolanos et al.
5,793,409 A 8/1998 Tetsumura
5,793,438 A 8/1998 Bedard
5,793,964 A 8/1998 Rogers et al.
5,793,971 A 8/1998 Fujita et al.
5,793,972 A 8/1998 Shane et al.
5,794,217 A 8/1998 Allen
5,796,952 A 8/1998 Davis et al.
5,797,011 A 8/1998 Kroll et al.
5,798,785 A 8/1998 Hendricks et al.
5,801,747 A 9/1998 Bedard
5,801,785 A 9/1998 Crump et al.
5,801,787 A 9/1998 Schein et al.
5,802,284 A 9/1998 Karlton et al.
5,805,154 A 9/1998 Brown
5,805,155 A 9/1998 Allibhoy et al.
5,805,167 A 9/1998 van Cruyningen
5,805,235 A 9/1998 Bedard
5,805,763 A 9/1998 Lawler et al.
5,805,804 A 9/1998 Laursen et al.
5,805,806 A 9/1998 McArthur
5,808,608 A 9/1998 Young et al.
5,808,694 A 9/1998 Usui et al.
5,809,204 A 9/1998 Young et al.
5,809,214 A 9/1998 Nureki et al.
5,809,242 A 9/1998 Shaw et al.
5,809,246 A 9/1998 Goldman
5,809,471 A 9/1998 Brodsky
5,812,123 A 9/1998 Rowe et al.
5,812,124 A 9/1998 Eick et al.
5,812,205 A 9/1998 Milnes et al.
5,812,505 A 9/1998 Shimoda et al.
5,812,931 A 9/1998 Yuen
5,812,937 A 9/1998 Takahisa et al.
5,815,145 A 9/1998 Matthews, III
5,815,146 A 9/1998 Youden et al.
5,815,662 A 9/1998 Ong
5,815,671 A 9/1998 Morrison
5,818,438 A 10/1998 Howe et al.
5,818,439 A 10/1998 Nagasaka et al.
5,818,441 A 10/1998 Throckmorton et al.
5,818,511 A 10/1998 Farry et al.
5,818,541 A 10/1998 Matsuura et al.
5,818,935 A 10/1998 Maa
5,819,019 A 10/1998 Nelson
5,819,156 A 10/1998 Belmont
5,819,160 A 10/1998 Foladare et al.
5,819,284 A 10/1998 Farber et al.
5,819,285 A 10/1998 Damico et al.
5,822,123 A 10/1998 Davis et al.
5,822,530 A 10/1998 Brown
5,825,407 A 10/1998 Cowe et al.
5,828,402 A 10/1998 Collings
5,828,419 A 10/1998 Bruette et al.
5,828,420 A 10/1998 Marshall et al.
5,828,839 A 10/1998 Moncreiff
5,828,945 A 10/1998 Klosterman
5,830,068 A 11/1998 Brenner et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,832,223	A	11/1998	Hara et al.
5,833,468	A	11/1998	Guy et al.
5,835,717	A	11/1998	Karlton et al.
5,838,314	A	11/1998	Neel et al.
5,838,383	A	11/1998	Chimoto et al.
5,838,419	A	11/1998	Holland
5,841,979	A	11/1998	Schulhof et al.
5,842,010	A	11/1998	Jain et al.
5,842,199	A	11/1998	Miller et al.
5,844,552	A	12/1998	Gaughan et al.
5,844,620	A	12/1998	Coleman et al.
5,847,750	A	12/1998	Srivastava et al.
5,848,352	A	12/1998	Dougherty et al.
5,848,396	A	12/1998	Gerace
5,848,397	A	12/1998	Marsh et al.
5,850,218	A	12/1998	LaJoie et al.
5,851,149	A	12/1998	Xidos et al.
5,852,437	A	12/1998	Wugofski et al.
5,861,881	A	1/1999	Freeman et al.
5,861,906	A	1/1999	Dunn et al.
5,862,292	A	1/1999	Kubota et al.
5,864,823	A	1/1999	Levitan
5,867,226	A	2/1999	Wehmeyer et al.
5,867,227	A	2/1999	Yamaguchi
5,867,228	A	2/1999	Miki et al.
5,867,233	A	2/1999	Tanaka et al.
5,870,543	A	2/1999	Ronning
5,870,754	A	2/1999	Dimitrova et al.
5,872,588	A	2/1999	Aras et al.
5,873,660	A	2/1999	Walsh et al.
5,874,985	A	2/1999	Matthews, III
5,875,108	A	2/1999	Hoffberg et al.
5,877,906	A	3/1999	Nagasawa et al.
5,880,720	A	3/1999	Iwafune et al.
5,880,768	A	3/1999	Lemmons et al.
5,881,245	A	3/1999	Thompson
5,883,621	A	3/1999	Iwamura
5,883,677	A	3/1999	Hofmann
5,884,028	A	3/1999	Kindell et al.
5,886,691	A	3/1999	Furuya et al.
5,886,707	A	3/1999	Berg
5,886,731	A	3/1999	Ebisawa
5,886,732	A	3/1999	Humpleman
5,887,243	A	3/1999	Harvey et al.
5,889,950	A	3/1999	Kuzma
5,890,138	A	3/1999	Godin et al.
5,892,498	A	4/1999	Marshall et al.
5,892,535	A	4/1999	Allen et al.
5,892,536	A	4/1999	Logan et al.
5,892,767	A	4/1999	Bell et al.
5,892,915	A	4/1999	Duso et al.
5,894,589	A	4/1999	Reber et al.
5,895,474	A	4/1999	Maarek et al.
5,896,414	A	4/1999	Meyer et al.
5,898,441	A	4/1999	Flurry
5,898,456	A	4/1999	Wahl
5,899,582	A	5/1999	DuLac
5,899,920	A	5/1999	DeSatnick et al.
5,900,867	A	5/1999	Schindler et al.
5,900,904	A	5/1999	Okada et al.
5,900,905	A	5/1999	Shoff et al.
5,903,234	A	5/1999	Kimura
5,903,263	A	5/1999	Emura
5,903,264	A	5/1999	Moeller et al.
5,903,314	A	5/1999	Niijima et al.
5,903,545	A	5/1999	Sabourin et al.
5,903,816	A	5/1999	Broadwin et al.
5,905,497	A	5/1999	Vaughan et al.
5,905,522	A	5/1999	Lawler
5,905,847	A	5/1999	Kobayashi et al.
5,905,865	A	5/1999	Palmer et al.
5,907,322	A	5/1999	Kelly et al.
5,907,323	A	5/1999	Lawler et al.
5,907,366	A	5/1999	Farmer et al.
5,909,638	A	6/1999	Allen
5,911,046	A	6/1999	Amano
5,912,664	A	6/1999	Eick et al.
5,913,039	A	6/1999	Nakamura et al.
5,914,712	A	6/1999	Sartain et al.
5,914,746	A	6/1999	Matthews, III et al.
5,914,941	A	6/1999	Janky
5,915,026	A	6/1999	Mankovitz
5,915,090	A	6/1999	Joseph et al.
5,915,094	A	6/1999	Kouloheris et al.
5,915,243	A	6/1999	Smolen
5,915,250	A	6/1999	Jain et al.
5,916,303	A	6/1999	Scott
5,917,481	A	6/1999	Rzeszewski et al.
5,917,538	A	6/1999	Asamizuya
5,917,830	A	6/1999	Chen et al.
5,917,835	A	6/1999	Barrett et al.
5,918,014	A	6/1999	Robinson
5,920,700	A	7/1999	Gordon et al.
5,920,702	A	7/1999	Bleidt et al.
5,920,800	A	7/1999	Schafer
5,922,045	A	7/1999	Hanson
5,922,048	A	7/1999	Emura
5,922,071	A	7/1999	Taylor et al.
5,923,361	A	7/1999	Sutton, Jr.
5,923,848	A	7/1999	Goodhand et al.
5,926,204	A	7/1999	Mayer
5,926,205	A	7/1999	Krause et al.
5,926,624	A	7/1999	Katz et al.
5,928,327	A	7/1999	Wang et al.
5,929,849	A	7/1999	Kikinis
5,929,850	A	7/1999	Broadwin et al.
5,929,932	A	7/1999	Otsuki et al.
5,930,473	A	7/1999	Teng et al.
5,930,493	A	7/1999	Ottesen et al.
5,931,901	A	8/1999	Wolfe et al.
5,931,905	A	8/1999	Hashimoto et al.
5,933,603	A	8/1999	Vahalia et al.
5,933,835	A	8/1999	Adams et al.
5,935,206	A	8/1999	Dixon et al.
5,936,569	A	8/1999	St.ang.hle et al.
5,936,614	A	8/1999	An et al.
5,936,679	A	8/1999	Kasahara et al.
5,937,160	A	8/1999	Davis et al.
5,939,695	A	8/1999	Nelson
5,940,071	A	8/1999	Treffers et al.
5,940,073	A	8/1999	Klosterman et al.
5,940,572	A	8/1999	Balaban et al.
5,940,614	A	8/1999	Allen et al.
5,943,046	A	8/1999	Cave et al.
5,943,047	A	8/1999	Suzuki
5,945,987	A	8/1999	Dunn
5,945,988	A	8/1999	Williams et al.
5,946,386	A	8/1999	Rogers et al.
5,946,678	A	8/1999	Aalbersberg
5,947,746	A	9/1999	Tsai
5,947,867	A	9/1999	Gierer et al.
5,949,411	A	9/1999	Doerr et al.
5,949,954	A	9/1999	Young et al.
5,951,642	A	9/1999	Onoe et al.
5,953,005	A	9/1999	Liu
5,955,988	A	9/1999	Blonstein et al.
5,956,482	A	9/1999	Agraharam et al.
5,956,716	A	9/1999	Kenner et al.
5,959,592	A	9/1999	Petruzzelli
5,959,659	A	9/1999	Dokic
5,959,688	A	9/1999	Schein et al.
5,960,411	A	9/1999	Hartman et al.
5,961,603	A	10/1999	Kunkel et al.
5,963,202	A	10/1999	Polish
5,963,264	A	10/1999	Jackson
5,963,645	A	10/1999	Kigawa et al.
5,964,455	A	10/1999	Catanzarite et al.
5,969,714	A	10/1999	Butcher
5,969,748	A	10/1999	Casement et al.
5,970,486	A	10/1999	Yoshida et al.
5,973,680	A	10/1999	Ueda
5,973,683	A	10/1999	Cragun et al.
5,973,722	A	10/1999	Wakai et al.
5,974,217	A	10/1999	Haraguchi

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,974,222 A 10/1999 Yuen et al.
5,977,963 A 11/1999 Gaughan et al.
5,977,964 A 11/1999 Williams et al.
5,978,044 A 11/1999 Choi
5,978,567 A 11/1999 Rebane et al.
5,978,843 A 11/1999 Wu et al.
5,983,236 A 11/1999 Yager et al.
5,986,650 A 11/1999 Ellis et al.
5,987,213 A 11/1999 Mankovitz et al.
5,987,509 A 11/1999 Portuesi
5,987,621 A 11/1999 Duso et al.
5,988,078 A 11/1999 Levine
5,990,881 A 11/1999 Inoue et al.
5,990,890 A 11/1999 Etheredge
5,990,927 A 11/1999 Hendricks et al.
5,991,498 A 11/1999 Young
5,991,735 A 11/1999 Gerace
5,991,799 A 11/1999 Yen et al.
5,995,092 A 11/1999 Yuen et al.
5,995,155 A 11/1999 Schindler et al.
5,997,964 A 12/1999 Klima, Jr.
5,999,698 A 12/1999 Nakai et al.
5,999,912 A 12/1999 Wodarz et al.
5,999,970 A 12/1999 Krisbergh et al.
6,002,393 A 12/1999 Hite et al.
6,002,394 A 12/1999 Schein et al.
6,002,443 A 12/1999 Iggulden
6,002,444 A 12/1999 Marshall et al.
6,002,720 A 12/1999 Yurt et al.
6,003,030 A 12/1999 Kenner et al.
6,005,561 A 12/1999 Hawkins et al.
6,005,562 A 12/1999 Shiga et al.
6,005,563 A 12/1999 White et al.
6,005,564 A 12/1999 Ahmad et al.
6,005,565 A 12/1999 Legall et al.
6,005,566 A 12/1999 Jones et al.
6,005,597 A 12/1999 Barrett et al.
6,005,600 A 12/1999 Hill
6,005,631 A 12/1999 Anderson et al.
6,006,218 A 12/1999 Breese et al.
6,006,257 A 12/1999 Slezak
6,008,802 A 12/1999 Iki et al.
6,008,803 A 12/1999 Rowe et al.
6,008,836 A 12/1999 Bruck et al.
6,009,465 A 12/1999 Decker et al.
6,011,546 A 1/2000 Bertram
6,012,086 A 1/2000 Lowell
6,012,089 A 1/2000 Hasegawa
6,012,091 A 1/2000 Boyce
6,014,137 A 1/2000 Burns
6,014,184 A 1/2000 Knee et al.
6,014,381 A 1/2000 Troxel et al.
6,014,502 A 1/2000 Moraes
6,014,693 A 1/2000 Ito et al.
6,014,694 A 1/2000 Aharoni et al.
6,014,706 A 1/2000 Cannon et al.
6,016,141 A 1/2000 Knudson et al.
6,018,359 A 1/2000 Kermode et al.
6,018,372 A 1/2000 Etheredge
6,018,765 A 1/2000 Durana et al.
6,018,768 A 1/2000 Ullman et al.
6,020,880 A 2/2000 Naimpally
6,020,883 A 2/2000 Herz et al.
6,020,912 A 2/2000 De Lang
6,020,929 A 2/2000 Marshall et al.
6,022,223 A 2/2000 Taniguchi et al.
6,023,267 A 2/2000 Chapuis et al.
6,023,725 A 2/2000 Ozawa et al.
6,025,837 A 2/2000 Matthews, III et al.
6,025,868 A 2/2000 Russo
6,025,886 A 2/2000 Koda
6,028,599 A 2/2000 Yuen et al.
6,028,600 A 2/2000 Rosin et al.
6,029,045 A 2/2000 Picco et al.
6,029,064 A 2/2000 Farris et al.
6,029,176 A 2/2000 Cannon
6,029,195 A 2/2000 Herz
6,031,806 A 2/2000 Tomita
6,035,091 A 3/2000 Kazo
6,035,304 A 3/2000 Machida et al.
6,037,933 A 3/2000 Blonstein et al.
6,038,367 A 3/2000 Abecassis
6,038,591 A 3/2000 Wolfe et al.
6,047,317 A 4/2000 Bisdikian et al.
6,049,539 A 4/2000 Lee et al.
6,049,824 A 4/2000 Simonin
6,052,145 A 4/2000 Macrae et al.
6,057,872 A 5/2000 Candelore
6,057,890 A 5/2000 Virden et al.
6,058,238 A 5/2000 Ng
6,061,060 A 5/2000 Berry et al.
6,061,082 A 5/2000 Park
6,061,097 A 5/2000 Satterfield
6,061,719 A 5/2000 Bendinelli et al.
6,064,376 A 5/2000 Berezowski et al.
6,064,980 A 5/2000 Jacobi et al.
6,065,047 A 5/2000 Carpenter et al.
6,067,303 A 5/2000 Aaker et al.
6,067,561 A 5/2000 Dillon
6,072,460 A 6/2000 Marshall et al.
6,072,982 A 6/2000 Haddad
6,075,526 A 6/2000 Rothmuller
6,075,551 A 6/2000 Berezowski et al.
6,075,575 A 6/2000 Schein et al.
6,078,348 A 6/2000 Klosterman et al.
6,081,291 A 6/2000 Ludwig, Jr.
6,081,750 A 6/2000 Hoffberg et al.
6,081,830 A 6/2000 Schindler
6,088,722 A 7/2000 Herz et al.
6,088,945 A 7/2000 Sanderfoot
6,091,883 A 7/2000 Artigalas et al.
6,091,884 A 7/2000 Yuen et al.
RE36,801 E 8/2000 Logan et al.
6,097,383 A 8/2000 Gaughan et al.
6,097,441 A 8/2000 Allport
6,098,065 A 8/2000 Skillen et al.
6,104,334 A 8/2000 Allport
6,104,705 A 8/2000 Ismail et al.
6,108,042 A 8/2000 Adams et al.
6,111,614 A 8/2000 Mugura et al.
6,112,186 A 8/2000 Bergh et al.
6,115,057 A 9/2000 Kwoh et al.
6,118,492 A 9/2000 Milnes et al.
6,119,098 A 9/2000 Guyot et al.
6,119,101 A 9/2000 Peckover
6,122,011 A 9/2000 Dias et al.
6,124,854 A 9/2000 Sartain et al.
6,125,230 A 9/2000 Yaginuma
6,130,726 A 10/2000 Darbee et al.
6,133,909 A 10/2000 Schein et al.
6,133,910 A 10/2000 Stinebruner
6,137,950 A 10/2000 Yuen
6,139,177 A 10/2000 Venkatraman et al.
6,141,003 A 10/2000 Chor et al.
6,141,488 A 10/2000 Knudson et al.
6,144,702 A 11/2000 Yurt et al.
6,147,714 A 11/2000 Terasawa et al.
6,147,715 A 11/2000 Yuen et al.
6,151,059 A 11/2000 Schein et al.
6,151,643 A 11/2000 Cheng et al.
6,154,203 A 11/2000 Yuen et al.
6,154,752 A 11/2000 Ryan
6,154,771 A 11/2000 Rangan et al.
6,155,001 A 12/2000 Marin
6,157,411 A 12/2000 Williams et al.
6,157,413 A 12/2000 Hanafee et al.
6,157,809 A 12/2000 Kambayashi
6,160,545 A 12/2000 Eyer et al.
6,160,546 A 12/2000 Thompson et al.
6,160,570 A 12/2000 Sitnik
6,160,989 A 12/2000 Hendricks et al.
6,163,316 A 12/2000 Killian
6,163,345 A 12/2000 Noguchi et al.
6,166,778 A 12/2000 Yamamoto et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,167,188 A 12/2000 Young et al.
6,169,542 B1 1/2001 Hooks et al.
6,172,674 B1 1/2001 Etheredge
6,172,677 B1 1/2001 Stautner et al.
6,173,271 B1 1/2001 Goodman et al.
6,175,362 B1 1/2001 Harms et al.
6,177,931 B1 1/2001 Alexander et al.
6,178,446 B1 1/2001 Gerszberg et al.
6,181,335 B1 1/2001 Hendricks et al.
6,182,106 B1 1/2001 Casey et al.
6,184,877 B1 2/2001 Dodson et al.
6,185,360 B1 2/2001 Inoue et al.
6,186,287 B1 2/2001 Heidenreich et al.
6,186,443 B1 2/2001 Shaffer
6,191,780 B1 2/2001 Martin et al.
6,195,501 B1 2/2001 Perry et al.
6,201,536 B1 3/2001 Hendricks et al.
6,202,058 B1 3/2001 Rose et al.
6,202,062 B1 3/2001 Cameron et al.
6,202,212 B1 3/2001 Sturgeon et al.
6,208,335 B1 3/2001 Gordon et al.
6,208,384 B1 3/2001 Schultheiss
6,208,799 B1 3/2001 Marsh et al.
6,209,129 B1 3/2001 Carr et al.
6,209,130 B1 3/2001 Rector, Jr. et al.
6,212,553 B1 4/2001 Lee et al.
6,216,264 B1 4/2001 Maze et al.
6,219,839 B1 4/2001 Sampsell
6,226,444 B1 5/2001 Goldschmidt Iki et al.
6,226,447 B1 5/2001 Sasaki et al.
6,233,389 B1 5/2001 Barton et al.
6,233,734 B1 5/2001 Macrae et al.
6,237,049 B1 5/2001 Ludtke
6,237,145 B1 5/2001 Narasimhan et al.
6,237,146 B1 5/2001 Richards et al.
6,239,794 B1 5/2001 Yuen et al.
6,240,555 B1 5/2001 Shoff et al.
6,243,129 B1 6/2001 Deierling
6,253,203 B1 6/2001 O'Flaherty et al.
6,256,071 B1 7/2001 Hiroi
6,256,785 B1 7/2001 Klappert et al.
6,257,268 B1 7/2001 Hope et al.
6,262,721 B1 7/2001 Tsukidate et al.
6,262,772 B1 7/2001 Shen et al.
6,263,501 B1 7/2001 Schein et al.
6,263,505 B1 7/2001 Walker et al.
6,263,507 B1 7/2001 Ahmad et al.
6,266,814 B1 7/2001 Lemmons et al.
6,268,849 B1 7/2001 Boyer et al.
6,275,268 B1 8/2001 Ellis et al.
6,275,648 B1 8/2001 Knudson et al.
6,275,989 B1 8/2001 Broadwin et al.
6,279,157 B1 8/2001 Takasu
6,282,713 B1 8/2001 Kitsukawa et al.
6,285,713 B1 9/2001 Nakaya et al.
6,286,005 B1 9/2001 Cannon
6,286,140 B1 9/2001 Ivanyi
6,289,346 B1 9/2001 Milewski et al.
6,292,624 B1 9/2001 Saib et al.
6,298,482 B1 10/2001 Seidman et al.
6,310,886 B1 10/2001 Barton
6,311,877 B1 11/2001 Yang
6,312,336 B1 11/2001 Handelman et al.
6,314,575 B1 11/2001 Billock et al.
6,317,784 B1 11/2001 Mackintosh et al.
6,317,881 B1 11/2001 Shah-Nazaroff et al.
6,317,885 B1 11/2001 Fries
6,320,588 B1 11/2001 Palmer et al.
6,321,991 B1 11/2001 Knowles
6,323,911 B1 11/2001 Schein et al.
6,323,931 B1 11/2001 Fujita et al.
6,324,338 B1 11/2001 Wood et al.
6,326,982 B1 12/2001 Wu et al.
6,327,049 B1 12/2001 Ohtsuka
6,327,418 B1 12/2001 Barton
6,330,586 B1 12/2001 Yates et al.
6,331,877 B1 12/2001 Bennington et al.
6,334,022 B1 12/2001 Ohba et al.
6,335,722 B1 1/2002 Tani et al.
6,335,963 B1 1/2002 Bosco
6,337,715 B1 1/2002 Inagaki et al.
6,341,195 B1 1/2002 Mankovitz et al.
6,341,374 B2 1/2002 Schein et al.
6,342,926 B1 1/2002 Hanafee et al.
6,343,311 B1 1/2002 Nishida et al.
6,349,410 B1 2/2002 Lortz
6,353,929 B1 3/2002 Houston
6,357,042 B2 3/2002 Srinivasan et al.
6,357,043 B1 3/2002 Ellis et al.
6,359,636 B1 3/2002 Schindler et al.
6,359,661 B1 3/2002 Nickum
6,363,525 B1 3/2002 Dougherty et al.
6,366,890 B1 4/2002 Usrey
6,367,080 B1 4/2002 Enomoto et al.
6,373,528 B1 4/2002 Bennington et al.
6,381,582 B1 4/2002 Walker et al.
6,388,714 B1 5/2002 Schein et al.
6,389,593 B1 5/2002 Yamagishi
6,392,710 B1 5/2002 Gonsalves et al.
6,396,546 B1 5/2002 Alten et al.
6,400,407 B1 6/2002 Zigmond et al.
6,405,370 B1 6/2002 Jarrell
6,405,371 B1 6/2002 Oosterhout et al.
6,405,926 B1 6/2002 Yomogida et al.
6,408,437 B1 6/2002 Hendricks et al.
6,411,308 B1 6/2002 Blonstein et al.
6,411,696 B1 6/2002 Iverson et al.
6,412,110 B1 6/2002 Schein et al.
6,415,438 B1 7/2002 Blackketter et al.
6,418,556 B1 7/2002 Bennington et al.
6,421,067 B1 7/2002 Kamen et al.
6,426,779 B1 7/2002 Noguchi et al.
6,430,743 B1 8/2002 Matsuura
6,434,614 B1 8/2002 Blumenau
6,437,836 B1 8/2002 Huang et al.
6,438,579 B1 8/2002 Hosken
6,441,832 B1 8/2002 Tao et al.
6,442,332 B1 8/2002 Knudson et al.
6,445,306 B1 9/2002 Trovato et al.
6,446,261 B1 9/2002 Rosser
6,453,471 B1 9/2002 Klosterman
RE37,881 E 10/2002 Haines
6,460,180 B1 10/2002 Park et al.
6,463,585 B1 10/2002 Hendricks et al.
6,469,753 B1 10/2002 Klosterman et al.
6,470,497 B1 10/2002 Ellis et al.
6,473,559 B1 10/2002 Knudson et al.
6,477,579 B1 11/2002 Kunkel et al.
6,477,705 B1 11/2002 Yuen et al.
6,480,667 B1 11/2002 O'Connor
6,483,986 B1 11/2002 Krapf
6,486,892 B1 11/2002 Stern
6,486,920 B2 11/2002 Arai et al.
6,487,362 B1 11/2002 Yuen et al.
6,493,876 B1 12/2002 DeFreese et al.
6,498,895 B2 12/2002 Young et al.
6,499,138 B1 12/2002 Swix et al.
6,502,241 B1 12/2002 Kretz et al.
6,505,348 B1 1/2003 Knowles et al.
6,507,953 B1 1/2003 Horlander et al.
6,509,908 B1 1/2003 Croy et al.
6,515,680 B1 2/2003 Hendricks et al.
6,516,323 B1 2/2003 Kamba
6,516,467 B1 2/2003 Schindler et al.
6,526,577 B1 2/2003 Knudson et al.
6,530,082 B1 3/2003 Del Sesto et al.
6,532,589 B1 3/2003 Proehl et al.
6,536,515 B2 3/2003 Freitag et al.
6,539,548 B1 3/2003 Hendricks et al.
6,542,169 B1 4/2003 Marshall et al.
6,545,722 B1 4/2003 Schultheiss et al.
6,546,399 B1 4/2003 Reed et al.
6,546,556 B1 4/2003 Kataoka et al.
6,564,005 B1 5/2003 Berstis

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,564,378 B1 5/2003 Satterfield et al.
6,564,379 B1 5/2003 Knudson et al.
6,567,892 B1 5/2003 Horst et al.
6,567,982 B1 5/2003 Howe et al.
6,571,390 B1 5/2003 Dunn et al.
6,574,424 B1 6/2003 Dimitri et al.
6,580,870 B1 6/2003 Kanazawa et al.
6,587,127 B1 7/2003 Leeke et al.
6,588,013 B1 7/2003 Lumley et al.
6,591,058 B1 7/2003 O'Connor et al.
6,598,228 B2 7/2003 Hejna, Jr.
6,600,364 B1 7/2003 Liang et al.
6,600,503 B2 7/2003 Stautner et al.
6,601,074 B1 7/2003 Liebenow
6,601,237 B1 7/2003 Ten Kate et al.
6,606,128 B2 8/2003 Hanafee et al.
6,611,654 B1 8/2003 Shteyn
6,611,842 B1 8/2003 Brown
6,611,958 B1 8/2003 Shintani et al.
6,614,987 B1 9/2003 Ismail et al.
6,622,306 B1 9/2003 Kamada
6,631,523 B1 10/2003 Matthews, III et al.
6,637,029 B1 10/2003 Maissel et al.
6,640,337 B1 10/2003 Lu
6,646,685 B1 11/2003 Kim
6,651,251 B1 11/2003 Shoff et al.
6,660,503 B2 12/2003 Kierulff
6,661,468 B2 12/2003 Alten et al.
6,665,869 B1 12/2003 Ellis et al.
6,668,377 B1 12/2003 Dunn
6,670,971 B1 12/2003 Oral et al.
6,675,385 B1 1/2004 Wang
6,675,386 B1 1/2004 Hendricks et al.
6,678,706 B1 1/2004 Fishel
6,681,396 B1 1/2004 Bates et al.
6,687,906 B1 2/2004 Yuen et al.
6,696,373 B2 2/2004 Kinn et al.
6,698,020 B1 2/2004 Zigmond et al.
6,704,931 B1 3/2004 Schaffer et al.
6,715,126 B1 3/2004 Chang et al.
6,718,324 B2 4/2004 Edlund et al.
6,718,551 B1 4/2004 Swix et al.
6,721,954 B1 4/2004 Nickum
6,727,914 B1 4/2004 Gutta
6,728,967 B2 4/2004 Bennington et al.
6,732,369 B1 5/2004 Schein et al.
6,738,978 B1 5/2004 Hendricks et al.
6,742,183 B1 5/2004 Reynolds et al.
6,744,967 B2 6/2004 Kaminski et al.
6,745,391 B1 6/2004 Macrae et al.
6,750,881 B1 6/2004 Appelman
6,750,885 B1 6/2004 Finch, II et al.
6,751,800 B1 6/2004 Fukuda et al.
6,754,904 B1 6/2004 Cooper et al.
6,756,987 B2 6/2004 Goyins et al.
6,756,997 B1 6/2004 Ward, III et al.
6,757,691 B1 6/2004 Welsh et al.
6,757,906 B1 6/2004 Look et al.
6,760,537 B2 7/2004 Mankovitz
6,760,538 B1 7/2004 Bumgardner et al.
6,766,100 B1 7/2004 Komar et al.
6,766,956 B1 7/2004 Boylan, III et al.
6,771,317 B2 8/2004 Ellis et al.
6,771,886 B1 8/2004 Mendelsohn
6,772,433 B1 8/2004 LaJoie et al.
6,788,882 B1 9/2004 Geer et al.
6,792,197 B1 9/2004 Helmstetter
6,792,618 B1 9/2004 Bendinelli et al.
6,799,326 B2 9/2004 Boylan, III et al.
6,799,327 B1 9/2004 Reynolds et al.
6,802,074 B1 10/2004 Mitsui et al.
6,820,278 B1 11/2004 Ellis
6,828,993 B1 12/2004 Hendricks et al.
6,837,791 B1 1/2005 McNutt et al.
6,847,387 B2 1/2005 Roth
6,850,693 B2 2/2005 Young et al.
6,857,131 B1 2/2005 Yagawa et al.
6,865,746 B1 3/2005 Herrington et al.
6,868,551 B1 3/2005 Lawler et al.
6,898,762 B2 5/2005 Ellis et al.
6,920,278 B1 7/2005 Yano et al.
6,920,281 B1 7/2005 Agnibotri et al.
6,925,035 B2 8/2005 Ueki
6,925,567 B1 8/2005 Hirata et al.
6,934,964 B1 8/2005 Schaffer et al.
6,938,208 B2 8/2005 Reichardt
6,973,669 B2 12/2005 Daniels
6,983,478 B1 1/2006 Grauch et al.
6,983,483 B2 1/2006 Maze et al.
6,985,188 B1 1/2006 Hurst, Jr.
6,999,698 B2 2/2006 Yamauchi et al.
7,003,792 B1 2/2006 Yuen
7,007,294 B1 2/2006 Kurapati
7,013,478 B1 3/2006 Hendricks et al.
7,017,118 B1 3/2006 Carroll
7,017,179 B1 3/2006 Asamoto et al.
7,027,716 B1 4/2006 Boyle et al.
7,028,323 B2 4/2006 Franken et al.
7,028,326 B1 4/2006 Westlake et al.
7,029,935 B2 4/2006 Negley et al.
7,039,935 B2 5/2006 Knudson et al.
7,047,241 B1 5/2006 Erickson
7,047,550 B1 5/2006 Yasukawa et al.
7,050,988 B2 5/2006 Atcheson et al.
7,053,964 B2 5/2006 Moon
7,058,635 B1 6/2006 Shah-Nazaroff et al.
7,065,709 B2 6/2006 Ellis et al.
7,069,576 B1 6/2006 Knudson et al.
7,073,187 B1 7/2006 Hendricks et al.
7,088,910 B2 8/2006 Potrebic et al.
7,096,486 B1 8/2006 Ukai et al.
7,100,185 B2 8/2006 Bennington et al.
7,117,518 B1 10/2006 Takahashi et al.
7,134,131 B1 11/2006 Hendricks et al.
7,143,430 B1 11/2006 Fingerman et al.
7,151,886 B2 12/2006 Young et al.
7,159,232 B1 1/2007 Blackketter et al.
7,165,098 B1 1/2007 Boyer et al.
7,181,128 B1 2/2007 Wada et al.
7,185,355 B1 2/2007 Ellis et al.
7,187,847 B2 3/2007 Young et al.
7,188,356 B1 3/2007 Miura et al.
7,200,852 B1 4/2007 Block
7,200,859 B1 4/2007 Perlman et al.
7,209,640 B2 4/2007 Young et al.
7,209,915 B1 4/2007 Taboada et al.
7,218,839 B2 5/2007 Plourde, Jr. et al.
7,229,012 B1 6/2007 Enright et al.
7,229,354 B2 6/2007 McNutt et al.
7,243,139 B2 7/2007 Ullman et al.
7,243,364 B2 7/2007 Dunn et al.
7,266,833 B2 9/2007 Ward, III et al.
7,277,859 B2 10/2007 Watanabe et al.
7,284,202 B1 10/2007 Zenith
7,287,267 B2 10/2007 Knudson et al.
7,293,276 B2 11/2007 Phillips et al.
7,293,279 B1 11/2007 Asmussen
7,328,450 B2 2/2008 Macrae et al.
7,343,614 B1 3/2008 Hendricks et al.
7,349,976 B1 3/2008 Glaser et al.
7,356,246 B1 4/2008 Kobb
7,356,547 B2 4/2008 Ozer et al.
7,363,645 B1 4/2008 Hendricks
7,369,749 B2 5/2008 Ichioka et al.
7,369,750 B2 5/2008 Cheng et al.
7,370,342 B2 5/2008 Ismail et al.
7,392,532 B2 6/2008 White et al.
7,398,541 B2 7/2008 Bennington et al.
7,403,935 B2 7/2008 Horvitz et al.
7,412,441 B2 8/2008 Scott, III et al.
7,437,751 B2 10/2008 Daniels
7,440,677 B2 10/2008 Strasser
7,440,993 B1 10/2008 Philyaw et al.
7,454,515 B2 11/2008 Lamkin et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,454,772	B2	11/2008	Fellenstein et al.	
7,467,398	B2 *	12/2008	Fellenstein et al.	725/53
7,477,832	B2	1/2009	Young et al.	
7,478,414	B1	1/2009	Glusker et al.	
7,480,929	B2	1/2009	Klosterman et al.	
7,487,528	B2	2/2009	Satterfield et al.	
7,487,529	B1	2/2009	Orlick	
7,493,641	B2	2/2009	Klosterman et al.	
7,503,055	B2	3/2009	Reynolds et al.	
7,506,350	B2	3/2009	Johnson	
7,519,268	B2	4/2009	Juen et al.	
7,533,400	B1	5/2009	Hailey et al.	
7,540,010	B2	5/2009	Hanaya et al.	
7,567,747	B2	7/2009	Hira	
7,577,336	B2	8/2009	Srinivasan et al.	
7,590,993	B1	9/2009	Hendricks et al.	
7,599,753	B2	10/2009	Taylor et al.	
7,603,685	B2	10/2009	Knudson et al.	
7,624,412	B2	11/2009	McEvilly et al.	
7,634,786	B2	12/2009	Knee et al.	
7,665,109	B2	2/2010	Matthews, III et al.	
7,673,315	B1	3/2010	Wong et al.	
7,685,620	B2 *	3/2010	Fellenstein et al.	725/53
7,689,995	B1	3/2010	Francis et al.	
7,707,617	B2	4/2010	Birleson	
7,721,307	B2	5/2010	Hendricks et al.	
7,725,467	B2	5/2010	Yamamoto et al.	
7,757,254	B2	7/2010	Shoff et al.	
7,770,196	B1	8/2010	Hendricks	
7,778,158	B2	8/2010	Vogel et al.	
7,779,437	B2	8/2010	Barton	
7,779,445	B2	8/2010	Ellis	
7,793,326	B2	9/2010	McCoskey et al.	
7,801,888	B2	9/2010	Rao et al.	
7,813,822	B1	10/2010	Hoffberg	
7,823,055	B2	10/2010	Sull et al.	
7,840,577	B2	11/2010	Ortega et al.	
7,859,571	B1	12/2010	Brown et al.	
7,882,520	B2	2/2011	Beach et al.	
7,895,218	B2	2/2011	Venkataraman et al.	
7,895,625	B1	2/2011	Bryan et al.	
7,925,141	B2	4/2011	Geer et al.	
7,962,935	B2	6/2011	Kurosaki et al.	
7,996,864	B2	8/2011	Yuen et al.	
8,051,450	B2	11/2011	Robarts et al.	
8,065,702	B2	11/2011	Goldberg et al.	
8,078,751	B2	12/2011	Janik et al.	
8,087,050	B2	12/2011	Ellis et al.	
8,091,110	B2	1/2012	Ellis et al.	
8,112,776	B2	2/2012	Schein et al.	
8,230,343	B2	7/2012	Logan et al.	
8,265,458	B2	9/2012	Helmstetter	
8,275,764	B2	9/2012	Jeon et al.	
8,302,127	B2	10/2012	Klarfeld et al.	
8,363,679	B2	1/2013	Sorenson et al.	
8,370,884	B2	2/2013	Ellis	
8,397,255	B2	3/2013	Wachtfogel et al.	
8,478,750	B2	7/2013	Rao et al.	
8,490,134	B2	7/2013	Gerba et al.	
8,528,019	B1	9/2013	Dimitrova et al.	
8,613,020	B2	12/2013	Knudson et al.	
8,613,024	B2	12/2013	Bovenschulte et al.	
8,635,649	B2	1/2014	Ward, III et al.	
8,707,366	B2	4/2014	Wong et al.	
2001/0001160	A1	5/2001	Shoff et al.	
2001/0013122	A1	8/2001	Hirata	
2001/0013124	A1	8/2001	Klosterman et al.	
2001/0019338	A1	9/2001	Roth	
2001/0021994	A1	9/2001	Nash	
2001/0025375	A1	9/2001	Ahmad et al.	
2001/0027555	A1	10/2001	Franken et al.	
2001/0027562	A1	10/2001	Schein et al.	
2001/0028782	A1	10/2001	Ohno et al.	
2001/0029610	A1	10/2001	Corvin et al.	
2001/0034237	A1	10/2001	Garahi	
2001/0042246	A1	11/2001	Yuen et al.	
2001/0043795	A1	11/2001	Wood et al.	
2001/0047298	A1	11/2001	Moore et al.	
2001/0049820	A1	12/2001	Barton	
2001/0054181	A1	12/2001	Corvin	
2002/0009283	A1	1/2002	Ichioka et al.	
2002/0010930	A1	1/2002	Shah-Nazaroff et al.	
2002/0026496	A1	2/2002	Boyer et al.	
2002/0032907	A1	3/2002	Daniels	
2002/0042913	A1	4/2002	Ellis et al.	
2002/0042914	A1	4/2002	Walker et al.	
2002/0042918	A1	4/2002	Townsend et al.	
2002/0048448	A1	4/2002	Daniels	
2002/0049973	A1	4/2002	Alten et al.	
2002/0056087	A1	5/2002	Berezowski et al.	
2002/0056098	A1	5/2002	White	
2002/0057893	A1	5/2002	Wood et al.	
2002/0059599	A1	5/2002	Schein et al.	
2002/0059602	A1	5/2002	Macrae et al.	
2002/0073424	A1	6/2002	Ward et al.	
2002/0076203	A1	6/2002	Takahashi	
2002/0078450	A1	6/2002	Bennington et al.	
2002/0083439	A1	6/2002	Eldering	
2002/0087981	A1	7/2002	Daniels	
2002/0090203	A1	7/2002	Mankovitz	
2002/0092017	A1	7/2002	Klosterman et al.	
2002/0095676	A1	7/2002	Knee et al.	
2002/0104096	A1	8/2002	Cramer et al.	
2002/0110353	A1	8/2002	Potrebic et al.	
2002/0112239	A1	8/2002	Goldman	
2002/0112249	A1	8/2002	Hendricks et al.	
2002/0120933	A1	8/2002	Knudson et al.	
2002/0124249	A1	9/2002	Shintani et al.	
2002/0129360	A1	9/2002	Lee	
2002/0129368	A1	9/2002	Schlack et al.	
2002/0138840	A1	9/2002	Schein et al.	
2002/0144279	A1	10/2002	Zhou	
2002/0147975	A1	10/2002	Seo	
2002/0147976	A1	10/2002	Yuen et al.	
2002/0147977	A1	10/2002	Hammett et al.	
2002/0154157	A1	10/2002	Sherr et al.	
2002/0154888	A1	10/2002	Allen et al.	
2002/0174424	A1	11/2002	Chang et al.	
2002/0174430	A1	11/2002	Ellis et al.	
2002/0174433	A1	11/2002	Baumgartner et al.	
2002/0184457	A1	12/2002	Yuasa et al.	
2002/0184626	A1	12/2002	Darbee et al.	
2002/0184629	A1	12/2002	Sie et al.	
2002/0188746	A1	12/2002	Drosset et al.	
2002/0191954	A1	12/2002	Beach et al.	
2002/0194585	A1	12/2002	Connelly	
2002/0194595	A1	12/2002	Miller et al.	
2002/0194596	A1	12/2002	Srivastava	
2002/0194598	A1	12/2002	Connelly	
2002/0194607	A1	12/2002	Connelly	
2002/0199185	A1	12/2002	Kaminski et al.	
2003/0005432	A1	1/2003	Ellis et al.	
2003/0005445	A1	1/2003	Schein et al.	
2003/0009766	A1	1/2003	Marolda	
2003/0010454	A1	1/2003	Bailey et al.	
2003/0012554	A1	1/2003	Zeidler et al.	
2003/0031465	A1	2/2003	Blake	
2003/0066089	A1	4/2003	Andersen	
2003/0070182	A1	4/2003	Pierre et al.	
2003/0088872	A1	5/2003	Maissel et al.	
2003/0088873	A1	5/2003	McCoy et al.	
2003/0098891	A1	5/2003	Molander	
2003/0103088	A1	6/2003	Dresti et al.	
2003/0106071	A1	6/2003	Akamatsu et al.	
2003/0110171	A1	6/2003	Ozer et al.	
2003/0110494	A1	6/2003	Bennington et al.	
2003/0110495	A1	6/2003	Bennington et al.	
2003/0110499	A1	6/2003	Knudson et al.	
2003/0115599	A1	6/2003	Bennington et al.	
2003/0115602	A1	6/2003	Knee et al.	
2003/0118323	A1	6/2003	Ismail et al.	
2003/0126607	A1	7/2003	Phillips et al.	
2003/0131355	A1	7/2003	Berenson et al.	
2003/0135490	A1	7/2003	Barrett et al.	

(56) **References Cited**

U.S. PATENT DOCUMENTS

2003/0145323 A1 7/2003 Hendricks et al.
2003/0146940 A1 8/2003 Ellis et al.
2003/0149988 A1 8/2003 Ellis et al.
2003/0154485 A1 8/2003 Johnson et al.
2003/0154486 A1 8/2003 Dunn et al.
2003/0163813 A1 8/2003 Klosterman et al.
2003/0164858 A1 9/2003 Klosterman et al.
2003/0177494 A1 9/2003 Satterfield et al.
2003/0182659 A1 9/2003 Ellis et al.
2003/0182661 A1 9/2003 Ellis et al.
2003/0188310 A1 10/2003 Klosterman et al.
2003/0188311 A1 10/2003 Yuen et al.
2003/0188314 A1 10/2003 Ellis et al.
2003/0192050 A1 10/2003 Fellenstein et al.
2003/0196201 A1 10/2003 Schein et al.
2003/0196203 A1 10/2003 Ellis et al.
2003/0198462 A1 10/2003 Bumgardner et al.
2003/0204847 A1 10/2003 Ellis et al.
2003/0206719 A1 11/2003 Bumgardner et al.
2003/0208756 A1 11/2003 Macrae et al.
2003/0208758 A1 11/2003 Schein et al.
2003/0208759 A1 11/2003 Gordon et al.
2003/0208767 A1 11/2003 Williamson et al.
2003/0210898 A1 11/2003 Juen et al.
2003/0212996 A1 11/2003 Wolzien
2003/0226144 A1 12/2003 Thurston et al.
2004/0001690 A1 1/2004 Boston et al.
2004/0003397 A1 1/2004 Boston et al.
2004/0003407 A1 1/2004 Hanafee et al.
2004/0003413 A1 1/2004 Boston et al.
2004/0015397 A1 1/2004 Barry et al.
2004/0019900 A1 1/2004 Knightbridge et al.
2004/0022278 A1 2/2004 Thomas et al.
2004/0049787 A1 3/2004 Maissel et al.
2004/0049788 A1 3/2004 Mori et al.
2004/0049794 A1 3/2004 Shao et al.
2004/0060063 A1 3/2004 Russ et al.
2004/0070594 A1 4/2004 Burke
2004/0073923 A1 4/2004 Wasserman
2004/0073924 A1 4/2004 Pendakur
2004/0078809 A1 4/2004 Drazin
2004/0078815 A1 4/2004 Lemmons et al.
2004/0088729 A1 5/2004 Petrovic et al.
2004/0098744 A1 5/2004 Gutta
2004/0103434 A1 5/2004 Ellis
2004/0103439 A1 5/2004 Macrae et al.
2004/0111742 A1 6/2004 Hendricks et al.
2004/0111745 A1 6/2004 Schein et al.
2004/0128686 A1 7/2004 Boyer et al.
2004/0133655 A1 7/2004 Yen et al.
2004/0133910 A1 7/2004 Gordon et al.
2004/0139465 A1 7/2004 Matthews et al.
2004/0156614 A1 8/2004 Bumgardner et al.
2004/0160862 A1 8/2004 Ueki
2004/0168189 A1 8/2004 Reynolds et al.
2004/0172661 A1 9/2004 Yagawa et al.
2004/0181814 A1 9/2004 Ellis et al.
2004/0187164 A1 9/2004 Kandasamy et al.
2004/0194131 A1 9/2004 Ellis et al.
2004/0194138 A1 9/2004 Boylan et al.
2004/0194141 A1 9/2004 Sanders
2004/0210932 A1 10/2004 Mori et al.
2004/0210935 A1 10/2004 Schein et al.
2004/0221310 A1 11/2004 Herrington et al.
2004/0243470 A1 12/2004 Ozer et al.
2004/0264920 A1 12/2004 Helmstetter
2005/0010949 A1 1/2005 Ward et al.
2005/0015804 A1 1/2005 LaJoie et al.
2005/0015815 A1 1/2005 Shoff et al.
2005/0020439 A1 1/2005 Ishii et al.
2005/0028218 A1 2/2005 Blake
2005/0076363 A1 4/2005 Dukes et al.
2005/0097622 A1 5/2005 Zigmond et al.
2005/0125240 A9 6/2005 Speiser et al.
2005/0129049 A1 6/2005 Srinivasan et al.
2005/0132264 A1 6/2005 Joshi et al.
2005/0138660 A1 6/2005 Boyer et al.
2005/0147378 A1 7/2005 Hira
2005/0149964 A1 7/2005 Thomas et al.
2005/0155056 A1 7/2005 Knee et al.
2005/0157217 A1 7/2005 Hendricks
2005/0160461 A1 7/2005 Baumgartner et al.
2005/0183123 A1 8/2005 Lee et al.
2005/0198668 A1 9/2005 Yuen et al.
2005/0204379 A1 9/2005 Yamamori
2005/0204382 A1 9/2005 Ellis
2005/0204388 A1 9/2005 Knudson et al.
2005/0216936 A1 9/2005 Knudson et al.
2005/0229214 A1 10/2005 Young et al.
2005/0229215 A1 10/2005 Schein et al.
2005/0235318 A1 10/2005 Grauch et al.
2005/0235320 A1 10/2005 Maze et al.
2005/0235323 A1 10/2005 Ellis et al.
2005/0240962 A1 10/2005 Cooper et al.
2005/0240968 A1 10/2005 Knudson et al.
2005/0244138 A1 11/2005 O'Connor et al.
2005/0251824 A1 11/2005 Thomas et al.
2005/0251827 A1 11/2005 Ellis et al.
2005/0267819 A1 12/2005 Kaplan
2005/0273819 A1 12/2005 Knudson et al.
2005/0278741 A1 12/2005 Robarts et al.
2005/0283796 A1 12/2005 Flickinger
2005/0283800 A1 12/2005 Ellis et al.
2006/0010470 A1 1/2006 Kurosaki et al.
2006/0031916 A1 2/2006 Colter et al.
2006/0037044 A1 2/2006 Daniels
2006/0083484 A1 4/2006 Wada et al.
2006/0136965 A1 6/2006 Ellis et al.
2006/0140584 A1 6/2006 Ellis et al.
2006/0146787 A1 7/2006 Wijnands et al.
2006/0161952 A1 7/2006 Herz et al.
2006/0165379 A1 7/2006 Agnihotri et al.
2006/0174277 A1 8/2006 Sezan et al.
2006/0190966 A1 8/2006 McKissick et al.
2006/0206912 A1 9/2006 Klarfeld et al.
2006/0212900 A1 9/2006 Ismail et al.
2006/0212904 A1 9/2006 Klarfeld et al.
2006/0218587 A1 9/2006 Kelts
2006/0248555 A1 11/2006 Eldering
2006/0248558 A1 11/2006 Barton et al.
2007/0005653 A1 1/2007 Marsh
2007/0016926 A1 1/2007 Ward et al.
2007/0033613 A1 2/2007 Ward et al.
2007/0067800 A1 3/2007 Wachtfogel et al.
2007/0074245 A1 3/2007 Nyako et al.
2007/0101377 A1 5/2007 Six et al.
2007/0113244 A1 5/2007 Verschueren et al.
2007/0136751 A1 6/2007 Garbow et al.
2007/0136753 A1 6/2007 Bovenschulte et al.
2007/0157242 A1 7/2007 Cordray et al.
2007/0162934 A1 7/2007 Roop et al.
2007/0180465 A1 8/2007 Ou et al.
2007/0186240 A1 8/2007 Ward et al.
2007/0204308 A1 8/2007 Nicholas et al.
2007/0212023 A1 9/2007 Whillock
2007/0214480 A1 9/2007 Kamen
2007/0234393 A1 10/2007 Walker et al.
2007/0244902 A1 10/2007 Seide et al.
2007/0266401 A1 11/2007 Hallberg
2007/0271582 A1 11/2007 Ellis et al.
2008/0066111 A1 3/2008 Ellis et al.
2008/0098436 A1 4/2008 White
2008/0109284 A1 5/2008 Slaney et al.
2008/0115169 A1 5/2008 Ellis et al.
2008/0126303 A1 5/2008 Park et al.
2008/0127265 A1 5/2008 Ward et al.
2008/0127266 A1 5/2008 Ward et al.
2008/0178216 A1 7/2008 Bennington et al.
2008/0178221 A1 7/2008 Schein et al.
2008/0178222 A1 7/2008 Bennington et al.
2008/0178223 A1 7/2008 Kwoh et al.
2008/0184286 A1 7/2008 Kwoh et al.
2008/0184305 A1 7/2008 Schein et al.
2008/0184308 A1 7/2008 Herrington et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2008/0184312	A1	7/2008	Schein et al.
2008/0184315	A1	7/2008	Ellis et al.
2008/0184319	A1	7/2008	Mankovitz
2008/0189744	A1	8/2008	Schein et al.
2008/0196053	A1	8/2008	Thomas et al.
2008/0222106	A1	9/2008	Rao et al.
2008/0232769	A1	9/2008	Jureczki et al.
2008/0235725	A1	9/2008	Hendricks
2008/0276275	A1	11/2008	Ellis
2008/0281689	A1	11/2008	Blinnikka et al.
2008/0288980	A1	11/2008	Schein et al.
2009/0025033	A1	1/2009	Stautner et al.
2009/0031335	A1	1/2009	Hendricks et al.
2009/0049481	A1	2/2009	Fellenstein et al.
2009/0060468	A1	3/2009	Carlberg et al.
2009/0060469	A1	3/2009	Olague et al.
2009/0070817	A1	3/2009	Ellis et al.
2009/0074380	A1	3/2009	Boston et al.
2009/0077589	A1	3/2009	Boyer et al.
2009/0119723	A1	5/2009	Tinsman
2009/0193458	A1	7/2009	Finseth et al.
2010/0115413	A1	5/2010	Schein et al.
2010/0115541	A1	5/2010	Schein et al.
2010/0122282	A1	5/2010	DuBose
2010/0146543	A1	6/2010	Knee et al.
2010/0175078	A1	7/2010	Knudson et al.
2010/0175081	A1	7/2010	Boylan, III et al.
2010/0192172	A1	7/2010	Thomas et al.
2010/0211969	A1	8/2010	Schein et al.
2010/0211975	A1	8/2010	Boyer et al.
2010/0247065	A1	9/2010	Cooper et al.
2010/0275230	A1	10/2010	Yuen et al.
2010/0299692	A1	11/2010	Rao et al.
2010/0319013	A1	12/2010	Knudson et al.
2011/0013885	A1	1/2011	Wong et al.
2011/0035771	A1	2/2011	Ward, III et al.
2011/0078628	A1	3/2011	Rosenberg
2011/0131601	A1	6/2011	Alten et al.
2011/0167451	A1	7/2011	Yuen et al.
2011/0173660	A1	7/2011	Schein et al.
2011/0185387	A1	7/2011	Schein et al.
2011/0209170	A1	8/2011	Schein et al.
2011/0258663	A1	10/2011	Lemmons et al.
2011/0265124	A1	10/2011	Goldenberg et al.
2011/0276995	A1	11/2011	Alten et al.
2012/0079539	A1	3/2012	Schein et al.
2012/0102523	A1	4/2012	Herz et al.
2012/0185901	A1	7/2012	Macrae et al.
2012/0272270	A1	10/2012	Boyer et al.
2012/0304211	A1	11/2012	Berezowski et al.
2013/0031582	A1	1/2013	Tinsman et al.
2013/0304586	A1	11/2013	Angles et al.

FOREIGN PATENT DOCUMENTS

AU	733993	B2	5/2001
AU	749209	B2	6/2002
AU	760568	B2	5/2003
AU	765648	B2	9/2003
AU	2008201306	A1	4/2008
CA	1030505	A1	5/1978
CA	1187197	A1	5/1985
CA	1188811	A1	6/1985
CA	1196082	A1	10/1985
CA	1200911	A1	2/1986
CA	1203625	A1	4/1986
CA	2151458	A1	6/1994
CA	2345161	A1	6/1994
CA	2164608	A1	12/1994
CA	2285645	A1	7/1998
CA	2297039	A1	1/1999
CA	2312326	A1	6/1999
CA	2322217	A1	9/1999
CA	2454011	A1	9/1999
CA	2324278	A1	11/1999
CA	2513282	A1	11/1999
CA	2364020	A1	5/2002
CN	1200221	A	11/1998
CN	1226030	A	8/1999
CN	1298604	A	6/2001
CN	1494321		5/2004
CN	1555191		12/2004
CN	1567986		1/2005
DE	29 18 846		11/1980
DE	31 51 492		7/1983
DE	3246225	A1	6/1984
DE	3337204		4/1985
DE	3505006	A1	8/1986
DE	36 21 263	A1	1/1988
DE	3640436	A1	6/1988
DE	3702220	A1	8/1988
DE	3909334	A1	9/1990
DE	41 43 074	A1	7/1992
DE	4201031	A1	7/1993
DE	4217246	A1	12/1993
DE	4240187	A1	6/1994
DE	4407701	A1	9/1995
DE	4440419	A1	5/1996
DE	19 531 121	A1	2/1997
DE	19 740 079	A1	3/1999
DE	19 931 046	A1	1/2001
DE	42 90 947	B4	11/2006
EP	0 072 153	A2	2/1983
EP	0122626	A2	10/1984
EP	0133985	A2	3/1985
EP	0 148 733	A1	7/1985
EP	0 222 025	A1	5/1987
EP	0 229 526	A2	7/1987
EP	0 239 884	A1	10/1987
EP	0 276425	A2	8/1988
EP	0337336	A2	10/1989
EP	0339675		11/1989
EP	0 363 847	A1	4/1990
EP	0 393 555		10/1990
EP	0396062	A2	11/1990
EP	0 401 015	A2	12/1990
EP	0401930		12/1990
EP	0408892	A1	1/1991
EP	0420123	A2	4/1991
EP	0424469		5/1991
EP	0424648	A2	5/1991
EP	0444496		9/1991
EP	0447968	A2	9/1991
EP	0 463 451	A2	1/1992
EP	0 477 754	A2	4/1992
EP	0477756	A2	4/1992
EP	0 489 387	A2	6/1992
EP	0488379		6/1992
EP	0 492 853	A2	7/1992
EP	0497 235		8/1992
EP	0532322	A2	3/1993
EP	0535749	A2	4/1993
EP	0536901	A2	4/1993
EP	0550911	A1	7/1993
EP	0 560 593		9/1993
EP	0 572 090		12/1993
EP	0 575 956	A2	12/1993
EP	0617563	A1	9/1994
EP	0 620 689	A1	10/1994
EP	0 624 040	A2	11/1994
EP	0624039	A2	11/1994
EP	0 644 689	A2	3/1995
EP	0 650 114	A2	4/1995
EP	0648054	A2	4/1995
EP	0 658 048	A1	6/1995
EP	0662771	A1	7/1995
EP	0 669 760		8/1995
EP	0 669 761	A2	8/1995
EP	0 673 164	A1	9/1995
EP	0 682 452	A2	11/1995
EP	0 705 036		4/1996
EP	0711076	A2	5/1996
EP	0 723369	A1	7/1996

(56) **References Cited**

FOREIGN PATENT DOCUMENTS

EP	0721253	A2	7/1996
EP	0725539	A2	8/1996
EP	0 742669		11/1996
EP	0752767	A2	1/1997
EP	0753964		1/1997
EP	0758833	A2	2/1997
EP	0762751	A2	3/1997
EP	0762756	A2	3/1997
EP	0763938		3/1997
EP	0 774 853		5/1997
EP	0 774 868	A1	5/1997
EP	0772360		5/1997
EP	0774866	A2	5/1997
EP	0775417	A1	5/1997
EP	0784405		7/1997
EP	0 789 488		8/1997
EP	0 793 225		9/1997
EP	0797355		9/1997
EP	0 804 028	A1	10/1997
EP	0 805 590	A2	11/1997
EP	0 806 111	A1	11/1997
EP	0805594	A2	11/1997
EP	0822718		2/1998
EP	0827340	A2	3/1998
EP	0 836 320		4/1998
EP	0 836 321		4/1998
EP	0 837599	A2	4/1998
EP	0834798		4/1998
EP	0843468		5/1998
EP	0848554	A2	6/1998
EP	0849948		6/1998
EP	0 852361	A2	7/1998
EP	0 854645		7/1998
EP	0851681		7/1998
EP	0852442	A1	7/1998
EP	0854654		7/1998
EP	0874524		10/1998
EP	0880856	A1	12/1998
EP	0 892 554	A2	1/1999
EP	0905985	A2	3/1999
EP	0 921 682	A2	6/1999
EP	0924927		6/1999
EP	0935393	A2	8/1999
EP	0 940 983		9/1999
EP	0 945003	B1	9/1999
EP	0940985		9/1999
EP	0944253	A1	9/1999
EP	0963119	A1	12/1999
EP	0988876	A1	3/2000
EP	1014715	A2	6/2000
EP	1 058 999	A1	12/2000
EP	1 059 749		12/2000
EP	1060617	A1	12/2000
EP	1067792	A2	1/2001
EP	1 093 305	A2	4/2001
EP	1095504	A2	5/2001
EP	1107588	A2	6/2001
EP	1135929	A1	9/2001
EP	0 856 847		11/2001
EP	1170944		1/2002
EP	1213919	A2	6/2002
EP	1217832	A1	6/2002
EP	1036466		3/2003
EP	0936811	B1	5/2003
EP	1763234	A2	3/2007
EP	1961228	A2	8/2008
FR	2662895	A1	12/1991
GB	1 554 411		10/1979
GB	2034995	A	6/1980
GB	2126002	A	3/1984
GB	2164194	A	3/1986
GB	2185670	A	7/1987
GB	2217144	A	10/1989
GB	2 227 622		8/1990
GB	2 229 595		9/1990
GB	2 256 115		11/1992
GB	2256546	A	12/1992
GB	2264409	A	8/1993
GB	2265792		10/1993
GB	2 275 585	A	8/1994
GB	2305049	A	3/1997
GB	2307381		5/1997
GB	2309134	A	7/1997
GB	2325537	A	11/1998
GB	2 346 251		8/2000
GB	2 375 674	A	11/2002
HK	1035285		3/2005
JP	58137334	A	8/1983
JP	58137344	A	8/1983
JP	58196738	A	11/1983
JP	58210776	A	12/1983
JP	59141878	A	8/1984
JP	61050470	A	3/1986
JP	61074476	A	4/1986
JP	62-060370		3/1987
JP	62060372		3/1987
JP	62060384	A	3/1987
JP	63-084396		4/1988
JP	06392177		4/1988
JP	63234679	A	9/1988
JP	11-32311	A	5/1989
JP	11-88280	A	7/1989
JP	1177782	A	7/1989
JP	01307944	A	12/1989
JP	02048879	A	2/1990
JP	02-119307	A	5/1990
JP	06-141250		5/1990
JP	2189753	A	7/1990
JP	10-234007		9/1990
JP	03-022770		1/1991
JP	03063990	A	3/1991
JP	03-167975	A	7/1991
JP	3178278	A	8/1991
JP	03-214919	A	9/1991
JP	03-243076	A	10/1991
JP	09-009244		1/1992
JP	04-44475		2/1992
JP	04079053		3/1992
JP	04-162889	A	6/1992
JP	04-180480	A	6/1992
JP	04227380		8/1992
JP	04250760	A	9/1992
JP	04-335395	A	11/1992
JP	4340258	A	11/1992
JP	05-103281	A	4/1993
JP	05-122692	A	5/1993
JP	05-183826		7/1993
JP	05260400	A	10/1993
JP	05284437A	A	10/1993
JP	05-314186	B2	11/1993
JP	05-339100	A	12/1993
JP	06-21907		1/1994
JP	06038165		2/1994
JP	06-090408	A	3/1994
JP	60-61935	A	3/1994
JP	06111413		4/1994
JP	06-124309		5/1994
JP	06-133235	A	5/1994
JP	61-024309		5/1994
JP	06504165		5/1994
JP	06-164973		6/1994
JP	06-217271		8/1994
JP	06243539		9/1994
JP	06-295312	A	10/1994
JP	06303541		10/1994
JP	06-350546		12/1994
JP	07-021619		1/1995
JP	0723356		1/1995
JP	07020254		1/1995
JP	07-050259		2/1995
JP	07-076592		3/1995
JP	07-135621	A	5/1995
JP	07123326		5/1995
JP	07-162776		6/1995

(56) **References Cited**

FOREIGN PATENT DOCUMENTS

JP	07147657	A	6/1995
JP	07154349	A	6/1995
JP	07160732		6/1995
JP	7-193788		7/1995
JP	07184131	A	7/1995
JP	07193762	A	7/1995
JP	07193763	A	7/1995
JP	07212732	A	8/1995
JP	7-262200	A	10/1995
JP	07-284033	A	10/1995
JP	07-288759		10/1995
JP	07-321748		12/1995
JP	08-32528		2/1996
JP	08-056352		2/1996
JP	0832538		2/1996
JP	08032528	A	2/1996
JP	08032538		2/1996
JP	08-137334	A	5/1996
JP	08125497		5/1996
JP	08130517	A	5/1996
JP	08-168046		6/1996
JP	8-506469		7/1996
JP	08506941		7/1996
JP	08-196738	A	8/1996
JP	08-234709		9/1996
JP	08251122		9/1996
JP	08275077		10/1996
JP	08289281	A	11/1996
JP	08-331546	A	12/1996
JP	09-009245		1/1997
JP	09-037223		2/1997
JP	09037151	A	2/1997
JP	9037168		2/1997
JP	09037171		2/1997
JP	09037172	A	2/1997
JP	09-065321		3/1997
JP	09-070020		3/1997
JP	9-83888		3/1997
JP	09083888	A	3/1997
JP	9-098362		4/1997
JP	09-102827	A	4/1997
JP	9-102944		4/1997
JP	09-114781		5/1997
JP	09 162818		6/1997
JP	09-162821		6/1997
JP	09-247565	A	9/1997
JP	092-44475	A	9/1997
JP	09-261609	A	10/1997
JP	09-270965	A	10/1997
JP	09289630		11/1997
JP	09322213		12/1997
JP	10-013774	A	1/1998
JP	10-042235		2/1998
JP	10-42235	A	2/1998
JP	10-501936		2/1998
JP	10042215		2/1998
JP	10042218		2/1998
JP	10-093933		4/1998
JP	10-143340		5/1998
JP	10-143349		5/1998
JP	10-228500		8/1998
JP	10228687		8/1998
JP	10257400	A	9/1998
JP	2838892		10/1998
JP	1998289205		10/1998
JP	10-512420		11/1998
JP	11008810		1/1999
JP	11-136615	A	5/1999
JP	11-136658		5/1999
JP	11177962	A	7/1999
JP	11-266414	A	9/1999
JP	11261917	A	9/1999
JP	11-313280	A	11/1999
JP	11308561	A	11/1999
JP	11-353071	A	12/1999
JP	2000-013708		1/2000
JP	2000/038886	A	2/2000
JP	2000-138886		5/2000
JP	2000-224533		8/2000
JP	2000-235546		8/2000
JP	2000216845	A	8/2000
JP	2000-261750	A	9/2000
JP	2000-287179	A	10/2000
JP	2000-306314		11/2000
JP	2000-312333	A	11/2000
JP	2000-339931	A	12/2000
JP	2001/008372	A	1/2001
JP	2001-022282	A	1/2001
JP	2001-086423	A	3/2001
JP	2001-088372		4/2001
JP	2001103404	A	4/2001
JP	2001-165669		6/2001
JP	2001-167522		6/2001
JP	2001167491	A	6/2001
JP	2001-213595		8/2001
JP	2001-257950		9/2001
JP	2001-513595		9/2001
JP	2002/010153	A	1/2002
JP	2002506327	A	2/2002
JP	2002/185931	A	6/2002
JP	2002/185951	A	6/2002
JP	2002/199318	A	7/2002
JP	2002-223425		8/2002
JP	2002-279969		9/2002
JP	2003-189200	A	7/2003
JP	2003-199004	A	7/2003
JP	2004-007592	A	1/2004
JP	2004-023326	A	1/2004
JP	2004-159004	A	6/2004
JP	2006066968	A	3/2006
JP	2006-340396		12/2006
JP	2007/053566	A	3/2007
JP	4062577		3/2008
JP	2010/057201	A	3/2010
JP	2010-119149	A	5/2010
JP	4510282		7/2010
JP	5053378	B2	10/2012
TW	0247388		10/1994
WO	WO-86/01359	A1	2/1986
WO	WO-86/01962		3/1986
WO	WO-87/03766		6/1987
WO	WO-88/04057	A1	6/1988
WO	WO-88/04507		6/1988
WO	WO-89/02682	A1	3/1989
WO	WO-89/03085		4/1989
WO	WO-89/12370		12/1989
WO	WO-90/00847	A1	1/1990
WO	WO-90/01243	A1	2/1990
WO	WO-90/07844	A1	7/1990
WO	WO-90/15507		12/1990
WO	WO-91/00670		1/1991
WO	WO-91/05436	A1	4/1991
WO	WO-91/06367	A2	5/1991
WO	WO-91/06912	A1	5/1991
WO	WO-91/07050	A1	5/1991
WO	WO-91/18476	A1	11/1991
WO	WO-92/04801		3/1992
WO	WO-92/22983	A2	12/1992
WO	WO-93/04473		3/1993
WO	WO-93/05452	A1	3/1993
WO	WO-9308542		4/1993
WO	WO-93/11638		6/1993
WO	WO-93/11639		6/1993
WO	WO-93/11640		6/1993
WO	WO-93/23957	A1	11/1993
WO	WO-9322877		11/1993
WO	WO-94/13107		6/1994
WO	WO-94/13284		6/1994
WO	WO-94/14281	A1	6/1994
WO	WO-94/14282	A1	6/1994
WO	WO-94/14283	A1	6/1994
WO	WO-94/14284	A1	6/1994
WO	WO-94/16441	A1	7/1994
WO	WO-94/21085	A1	9/1994

(56) **References Cited**

FOREIGN PATENT DOCUMENTS

WO	WO-94/23383	A1	10/1994
WO	WO-94/29811	A1	12/1994
WO	WO-95/01056		1/1995
WO	WO-95/01057	A1	1/1995
WO	WO-95/01058	A1	1/1995
WO	WO-95/01059	A1	1/1995
WO	WO-95/02945	A1	1/1995
WO	WO-95/04431	A2	2/1995
WO	WO-95/06389	A1	3/1995
WO	WO-95/07003		3/1995
WO	WO-95/10910		4/1995
WO	WO-95/15658	A1	6/1995
WO	WO-95/16568	A1	6/1995
WO	WO-9515649	A1	6/1995
WO	WO-9515657	A1	6/1995
WO	WO-95/19092	A1	7/1995
WO	WO-95/26095	A2	9/1995
WO	WO-95/26608	A1	10/1995
WO	WO-95/28055	A1	10/1995
WO	WO-95/28799	A1	10/1995
WO	WO-95/30961	A1	11/1995
WO	WO-95/32585		11/1995
WO	WO-95/32587		11/1995
WO	WO-9530302	A1	11/1995
WO	WO-9531069		11/1995
WO	WO-9532583	A1	11/1995
WO	WO-9532584		11/1995
WO	WO-95/33338	A1	12/1995
WO	WO-96/07270	A1	3/1996
WO	WO-96/08109	A1	3/1996
WO	WO-96/08113	A1	3/1996
WO	WO-96/08923	A1	3/1996
WO	WO-96/09721	A1	3/1996
WO	WO-96/13013	A1	5/1996
WO	WO-96/13932	A1	5/1996
WO	WO-96/13935	A1	5/1996
WO	WO-96/17467	A2	6/1996
WO	WO-96/17473		6/1996
WO	WO-96/20555		7/1996
WO	WO-96/21990	A2	7/1996
WO	WO-96/25821	A1	8/1996
WO	WO-96/26605		8/1996
WO	WO-96/27270	A1	9/1996
WO	WO-96/27982		9/1996
WO	WO-96/27989		9/1996
WO	WO-96/31980	A1	10/1996
WO	WO-96/33572		10/1996
WO	WO-96/34467	A1	10/1996
WO	WO-96/34486	A1	10/1996
WO	WO-96/34491	A1	10/1996
WO	WO-96/36172		11/1996
WO	WO-96/37075		11/1996
WO	WO-96/37983	A1	11/1996
WO	WO-96/37996	A1	11/1996
WO	WO-96/38799	A1	12/1996
WO	WO-96/38962		12/1996
WO	WO-96/41418	A1	12/1996
WO	WO-96/41470	A1	12/1996
WO	WO-96/41471	A1	12/1996
WO	WO-96/41472		12/1996
WO	WO-96/41477	A1	12/1996
WO	WO-96/41478		12/1996
WO	WO-97/02702	A2	1/1997
WO	WO-97/04595	A1	2/1997
WO	WO-97/07656		3/1997
WO	WO-97/12486		4/1997
WO	WO-97/13368		4/1997
WO	WO-97/17774	A1	5/1997
WO	WO-97/18675		5/1997
WO	WO-97/19555	A1	5/1997
WO	WO-97/21291	A2	6/1997
WO	WO-97/23997	A1	7/1997
WO	WO-97/26612	A1	7/1997
WO	WO-97/29458	A1	8/1997
WO	WO-97/31480		8/1997
WO	WO-97/32434	A1	9/1997
WO	WO-97/34413		9/1997
WO	WO-97/34414		9/1997
WO	WO-97/36422		10/1997
WO	WO-97/37500	A1	10/1997
WO	WO-97/40623		10/1997
WO	WO-97/41673	A2	11/1997
WO	WO-97/42763		11/1997
WO	WO-97/45786		12/1997
WO	WO-97/46016		12/1997
WO	WO-97/46943	A1	12/1997
WO	WO-97/47106		12/1997
WO	WO-97/47124		12/1997
WO	WO-97/47143		12/1997
WO	WO-97/48228	A1	12/1997
WO	WO-97/48230		12/1997
WO	WO-97/49237		12/1997
WO	WO-97/49241		12/1997
WO	WO-97/49242		12/1997
WO	WO-97/50251		12/1997
WO	WO-98/00975	A1	1/1998
WO	WO-98/00976		1/1998
WO	WO-98/01995		1/1998
WO	WO-98/06219		2/1998
WO	WO-98/07277	A1	2/1998
WO	WO-98/10589	A1	3/1998
WO	WO-98/12872		3/1998
WO	WO-98/14009	A1	4/1998
WO	WO-98/16062		4/1998
WO	WO-98/17033	A1	4/1998
WO	WO-98/17063	A1	4/1998
WO	WO-98/17064	A1	4/1998
WO	WO-98/18260	A1	4/1998
WO	WO-98/19459	A1	5/1998
WO	WO-98/20675	A1	5/1998
WO	WO-98/21664	A1	5/1998
WO	WO-98/21877		5/1998
WO	WO-98/21877	A2	5/1998
WO	WO-98/26569	A2	6/1998
WO	WO-98/26584		6/1998
WO	WO-98/26596		6/1998
WO	WO-98/27723		6/1998
WO	WO-98/28906	A2	7/1998
WO	WO-98/31115	A2	7/1998
WO	WO-98/31116	A2	7/1998
WO	WO-98/31148	A1	7/1998
WO	WO-98/34405	A1	8/1998
WO	WO-98/37695		8/1998
WO	WO-98/38831	A1	9/1998
WO	WO-98/39893	A2	9/1998
WO	WO-98/41020	A1	9/1998
WO	WO-98/43183	A1	10/1998
WO	WO-98/43406	A1	10/1998
WO	WO-98/47279		10/1998
WO	WO-98/47283		10/1998
WO	WO-98/47290	A1	10/1998
WO	WO-98/48566	A2	10/1998
WO	WO-98/53611	A1	11/1998
WO	WO-98/56172	A1	12/1998
WO	WO-98/56173	A1	12/1998
WO	WO-98/56176	A1	12/1998
WO	WO-98/56712	A1	12/1998
WO	WO-99/01984	A1	1/1999
WO	WO-99/03267	A1	1/1999
WO	WO-99/04561		1/1999
WO	WO-99/04570		1/1999
WO	WO-99/07142	A1	2/1999
WO	WO-99/11060	A1	3/1999
WO	WO-99/12320	A1	3/1999
WO	WO-99/12346	A2	3/1999
WO	WO-99/14947	A1	3/1999
WO	WO-99/18721	A1	4/1999
WO	WO-99/18722		4/1999
WO	WO-99/22502	A1	5/1999
WO	WO-99/27681	A2	6/1999
WO	WO-99/28897	A1	6/1999
WO	WO-99/29109	A1	6/1999
WO	WO-99/30491	A1	6/1999
WO	WO-99/31480	A1	6/1999

(56) **References Cited**

FOREIGN PATENT DOCUMENTS

WO	WO-99/33265	A1	7/1999
WO	WO-99/35584	A2	7/1999
WO	WO-99/35827	A1	7/1999
WO	WO-99/37045	A1	7/1999
WO	WO-99/38092	A1	7/1999
WO	WO-99/39280		8/1999
WO	WO-99/39466	A1	8/1999
WO	WO-99/45700		9/1999
WO	WO-99/45701	A1	9/1999
WO	WO-99/45702		9/1999
WO	WO-99/52279		10/1999
WO	WO-99/52285	A1	10/1999
WO	WO-99/56466		11/1999
WO	WO-99/56473	A1	11/1999
WO	WO-99/57707	A1	11/1999
WO	WO-99/57837	A2	11/1999
WO	WO-99/57839		11/1999
WO	WO-99/59275	A1	11/1999
WO	WO-99/60493	A1	11/1999
WO	WO-99/60783		11/1999
WO	WO-99/60789		11/1999
WO	WO-99/60790		11/1999
WO	WO-99/65237	A1	12/1999
WO	WO-99/65244	A1	12/1999
WO	WO-99/66725		12/1999
WO	WO-99/66726	A1	12/1999
WO	WO-00/04706	A2	1/2000
WO	WO-00/04708	A1	1/2000
WO	WO-00/04709	A1	1/2000
WO	WO-0002380	A2	1/2000
WO	WO-00/07368		2/2000
WO	WO-00/08850		2/2000
WO	WO-00/08851		2/2000
WO	WO-00/08852		2/2000
WO	WO-0005889	A1	2/2000
WO	WO-00/11865	A1	3/2000
WO	WO-00/13415	A2	3/2000
WO	WO-00/14951	A1	3/2000
WO	WO-00/16548		3/2000
WO	WO-0011869	A1	3/2000
WO	WO-0013416	A1	3/2000
WO	WO-0016336	A1	3/2000
WO	WO-00/28379	A1	5/2000
WO	WO-00/28734		5/2000
WO	WO-00/28739		5/2000
WO	WO-0027122	A1	5/2000
WO	WO-0027124	A1	5/2000
WO	WO-00/33560	A2	6/2000
WO	WO-00/33573	A1	6/2000
WO	WO-00/33578	A1	6/2000
WO	WO-0033160	A2	6/2000
WO	WO-0033224	A1	6/2000
WO	WO-0035193	A1	6/2000
WO	WO-00/40014	A1	7/2000
WO	WO-00/40025	A1	7/2000
WO	WO-00/49801	A1	8/2000
WO	WO-00/51310	A1	8/2000
WO	WO-00/57645	A1	9/2000
WO	WO-00/58214	A1	10/2000
WO	WO-00/58833		10/2000
WO	WO-00/58967		10/2000
WO	WO-00/59214	A1	10/2000
WO	WO-00/59220	A1	10/2000
WO	WO-00/59223		10/2000
WO	WO-00/62298		10/2000
WO	WO-00/62299		10/2000
WO	WO-00/62533		10/2000
WO	WO-00/67475		11/2000
WO	WO-00/78050	A1	12/2000
WO	WO-00/79798		12/2000
WO	WO-01/01308	A2	1/2001
WO	WO-01/01677	A1	1/2001
WO	WO-01/06784	A2	1/2001
WO	WO-0103088	A1	1/2001
WO	WO-01/11865	A1	2/2001
WO	WO-0110126	A1	2/2001
WO	WO-0110128	A1	2/2001
WO	WO 01/15438	A1	3/2001
WO	WO-01/22729		3/2001
WO	WO-0119086		3/2001
WO	WO-01/35662	A1	5/2001
WO	WO-01/37549	A2	5/2001
WO	WO-01-46843	A2	6/2001
WO	WO-01/47238		6/2001
WO	WO-01/47249		6/2001
WO	WO-01/47257		6/2001
WO	WO-01/47273		6/2001
WO	WO-01/47279		6/2001
WO	WO-0146869		6/2001
WO	WO-0150743		7/2001
WO	WO-0158158		8/2001
WO	WO-01/75649	A2	10/2001
WO	WO-01/76239		10/2001
WO	WO-01/76248	A2	10/2001
WO	WO-01/76704	A2	10/2001
WO	WO-01/89213	A1	11/2001
WO	WO-0182600	A2	11/2001
WO	WO-01/93588	A2	12/2001
WO	WO-02/25938		3/2002
WO	WO-02/31731		4/2002
WO	WO-02/31731	A2	4/2002
WO	WO-02/067579	A1	8/2002
WO	WO-02/069636	A1	9/2002
WO	WO-02/078317		10/2002
WO	WO-02/084992	A2	10/2002
WO	WO-03/005712	A1	1/2003
WO	WO-03/036970	A1	5/2003
WO	WO-03/047235	A2	6/2003
WO	WO-03/051051	A1	6/2003
WO	WO-2004/002156	A1	12/2003
WO	WO-2004/066180	A1	8/2004
WO	WO-2004066180		8/2004
WO	WO-2004/100526	A2	11/2004
WO	WO-2005/027512	A1	3/2005
WO	WO-2006/079977	A2	8/2006
WO	WO-2006079977		8/2006
WO	WO-2007/070422	A2	6/2007
WO	WO-2007/096815	A1	8/2007
WO	WO-2007/106464	A2	9/2007

OTHER PUBLICATIONS

"Final Office Action", U.S. Appl. No. 11/716,236, (Jul. 2, 2009),11 pages.

"Final Office Action", U.S. Appl. No. 11/716,236, (Nov. 4, 2009),11 pages.

"Non Final Office Action", U.S. Appl. No. 11/716,236, (Feb. 26, 2009),10 pages.

"Non-Final Office Action", U.S. Appl. No. 12/846,442, (Sep. 20, 2012),11 pages.

"Notice of Allowance", U.S. Appl. No. 11/716,236, (May 27, 2010), 7 pages.

"Notice of Allowance", U.S. Appl. No. 12/846,442, (Mar. 1, 2013), 7 pages.

"PCT Search Report and Written Opinion", Application No. PCT/US2008055460, (Aug. 8, 2008),13 pages.

Gutta, Srinivas et al., "TV Content Recommender System", http://pages.stern.nyu.edu/~ksk227/TV_content_recommender_AAAI2000.pdf, (2000), 3 pages.

Gutta, Srinivas et al., "TV Content Recommender System", Proceedings of the Seventeenth National Conference on Artificial Intelligence and Twelfth Conference on Innovative Applications of Artificial Intelligence, (Jul. 30, 2000), 2 pages.

Kojima, Akira et al., "Implementation Measures to Expand Metadata Application Services", http://www/ntt.co.jp/tr/0306/files/ntr200306051.pdf, (Jun. 2003), 6 pages.

Lee, Hee-Kyung et al., "Personalized Contents Guide and Browsing based on User Preference", http://vega.icu.ac.kr/~mccb-lab/publications/Paper/PersonalizedTV(2002).pdf, (2002),10 Pages.

Tol, et al., "Requirements and Scenarios for the Bi-directional Transport of Metadata", TV Anytime Meeting, Version 1.0, Document TV150,(Aug. 2, 2002), 7 pages.

(56) **References Cited**

OTHER PUBLICATIONS

U.S. Appl. No. 60/061,119, Oct. 6, 1997, Ward et al.
U.S. Appl. No. 09/356,268, Jul. 16, 1999, Rudnick et al.
U.S. Appl. No. 09/332,244, Jun. 11, 1999, Ellis et al.
U.S. Appl. No. 09/330,792, Jun. 11, 1999, Knudson et al.
"A New Approach to Addressability," CableData Brochure, 9 pages, undated.
"A Wonderworld of Services," The Sunday Times, Innovation section, p. 4, Jan. 7, 1996.
"Advanced Analog Systems—Addressable Terminals," General Instrument Corp. of Horsham, Pennsylvania, URL:http—www.gi.com-BUSAREA-AALOG-TERMINAL-WATCH-watch.html)—Printed from the Internet on Mar. 4, 1999.
"Columbia House CD-ROM Direct: Detail Page," accessed from the internet at http://web.archive.org/web/19961221160255/http://www.columbiahouse.com/cd/cgis . . . , copyright 1996, printed on Sep. 19, 2013, 1 page.
"Columbia House CD-ROM Direct: Download Demos!," accessed from the internet at http://web.archive.org/web/19961221095819/http://www.columbiahouse.com/cd/cgis . . . , copyright 1996, printed on Sep. 19, 2013, 3 pages.
"Columbia House CD-ROM Direct: Member Center," accessed from the internet at http://web.archive.org/web/19961221085905/http://www.columbiahouse.com/repl/cd/ . . . , copyright 1996, printed on Sep. 19, 2013, 2 pages.
"Columbia House CD-ROM Direct: The Connection," accessed from the internet at http://web.archive.org/web/19961221100721/http://www.columbiahouse.com/repl/cd/ . . . , copyright 1996, printed on Sep. 20, 2013, 1 page.
"Columbia House CD-ROM Direct: The Connection," accessed from the internet at http://web.archive.org/web/19961223152924/http://www.columbiahouse.com/repl/cd/ . . . , copyright 1996, printed on Sep. 20, 2013, 1 page.
"Columbia House Laser Disc Club: FAQ Answers," accessed from the internet at http://web.archive.org/web/19961223165516/http://www.columbiahouse.com/repl/lc/t . . . , copyright 1996, printed on Sep. 20, 2013, 5 pages.
"Columbia House Laser Disc Club: Join the Club," accessed from the internet at http://web.archive.org/web/19961221094037/http://www.columbiahouse.com/repl/lc/t . . . , copyright 1996, printed on Sep. 20, 2013, 2 pages.
"Columbia House Music Club: Join the Club," accessed from the internet at http://web.archive.org/web/19961221091101/http://www.columbiahouse.com/repl/mc . . . , copyright 1996, printed on Sep. 20, 2013.
"Columbia House Music Club: Search," accessed from the internet at http://web.archive.org/web/19961221114653/http://www.columbiahouse.com/repl/mc . . . , copyright 1996, printed on Sep. 19, 2013, 1 page.
"Columbia House Music Club: Shopping Cart," accessed from the internet at http://web.archive.org/web/19961221120941/http://www.columbiahouse.com/mc/cgis . . . , copyright 1996, printed on Sep. 19, 2013, 1 page.
"Columbia House Video Club: Essential Collection," accessed from the internet at http://web.archive.org/web/199612211131908/http://www.columbiahouse.com/vc/cgis/j . . . , copyright 1996, printed on Sep. 20, 2013, 1 page.
"Comdex—Mitsubishi Previews 40-Inch DiamondWeb TV," Newsbytes, Nov. 19, 1996, Abstract 2 pages.
"Cool Websites: [2 Star Edition]," Houston Chronicle, Houston, Texas, Jul. 11, 1996, p. 3, Abstract.
"Description of Digital Audio-Visual Functionalities (Technical Report)," Digital Audio-Visual Council (DAVIC), 1.3.1 Par 1:1998, 86 pages.
"Directv Digital Satellite Receiver—Operating Instructions," Sony Electronics Inc. (2001).
"Directv Plus2 System", Thompson Consumer Electronics, Inc. (1999).
"Directv Receiver—Owner's Manual," Directv, Inc. (2002).
"Directv Receiver with TiVo Digital Satellite Receiver-Recorder SAT-T60—Installation Guide," Sony Corporation (2000).
"Directv Receiver with TiVo Installation Guide," Philips (2000).
"Directv Receiver with TiVo Viewer's Guide" (1999, 2000).
"DishPro Satellite System—User's Guide," Dish Network, (undated), accessed 2008.
"Hobbes' Internet Timeline," RFC 2235, Mar. 22, 2007, 17 pages.
"Honey, is there anything good on the remote tonight?", advertisement from Multichannel News, Broadband Week Section, p. 168, Nov. 30, 1998.
"How Evolve Works," from the Internet at http://www.evolveproducts.com/network.html, printed on Dec. 28, 1998, 1 page.
"Lists> What's On Tonite TV Listings" Internet Article, [Online], Jan. 28, 1995, XP002378869 Retrieved from the Internet: URL: www.scout.wisc.edu/Projects/PastProjects/NH/95-01-31/0018.html> [retrieved on Apr. 28, 2006].
"Neue, Digitale Strategien—Bericht Von Den 5. Dermastaedter Fernsehtagen," FKT Fernseh Und Kinotechnik, vol. 49, No. 3, Mar. 1, 1995, pp. 135-139, XP000507348, Fachverlag Schiele & Schon GmbH., Berlin, DE, ISSN: 1430-9947.
"OpenTV(R) and Interactive Channel Form Strategic Alliance to Deliver Interactive Programming to Satellite Television Subscribers", from the Internet at http://www.opentv.com/news/interactivechannelfinal.htm, printed on Jun. 8, 1999, 3 pages.
"Personal Entertainment Guide—User's Guide," Version 1.0, Copyright 1991 by Lookahead Communications Inc, 82 pages.
"Prevue Channel Sep. 1, 1995 (part 1)," Prevue Guide, from the internet at http://www.youtube.com/watch?v=OVul78nH6RY, retrieved on Nov. 26, 2013, 1 page.
"Prevue Online Debuts Local Listings for 250 Systems; System-Specific Listings Include Multimedia Features—Free Build Acceleration," PR Newswire, Jun. 5, 1997, 2 pages.
"Prevue Online," Dec. 28, 1996, extract from web.archive.org, printed on Nov. 18, 2014, http://www.prevue.com, 1 page.
"PTV Recorder Setup Guide," Philips (2000).
"Reaching your subscribers is a complex and costly process-until now," from the Internet at http://www.evolveproducts.com/info.html, printed on Dec. 28, 1998, 1 page.
"Rewind, replay and unwind with new high-tech TV devices," by Lawrence J. Magid, LA Times. This document was printed from the Internet on Jun. 6, 1999 and bears a date of May 19, 1999.
"SONICblue Incorporated: ReplayTV 4000 User Guide 12.17, Chapter Five: Networking, Sep. 10, 2001, retrieved from the internet: (2001)."
"StarSight Interactive Television Program Guide III" Jim Leftwich and Steve Schein, Functional/Interactional Architecture Specification Document, Orbit Interaction, Palo Alto, California, Published before Apr. 19, 1995, 36 pages.
"Start Here," Sony, TiVo and Directv, (undated), accessed 2008.
"Step Up to the Superhighway," The Sunday Times, Innovation section, p. 6, Jan. 7, 1996.
"Sun's Next Steps in Digital Set-Tops," article in Cablevision, p. 56, Nov. 16, 1998.
"Television Viewing Habits of Three IQ Groups of Urban Middle School Students", KUNST, University of Pittsburgh, 1986, pp. 2-219 (54 pages).
"The Evolve EZ Guide. The Remote Control," from the Internet at http://www.evolveproducts.com/display2.html, printed on Dec. 28, 1998, 1 page.
"Viewdata Service Terminal Specification," British Post Office, Issue 5, Aug. 1978, 57 pages.
"VPV-Videotext Programs Videorecorder", by Bensch, IEEE Jun. 1988, pp. 788-792.
"What is Jini?", from the Internet at http://java.sun.com/products/jini/whitepapers/whatsjini.pdf, printed on Jan. 25, 1999, 4 pages.
"What's New @ Prevue Online—Real™Video," May 2, 1997, extract from web.archive.org, printed on Nov. 18, 2014, http://www.prevue.com/scripts/whatsnew.asp, 5 pages.
"What's On Tonite!," Jan. 28, 1995, retrieved from the internet at http://www.library.georgetown.edu/newjour/publication/whats-tonite-tm, retrieved on Dec. 11, 2013, 9 pages.

(56) **References Cited**

OTHER PUBLICATIONS

"Why Jini Now?", from the internet at http://java.sun.com/products/jini/whitepapers/whyjininow.pdf, printed on Jan. 25, 1999. The document bears a copyright date of 1998, 16 pages.
"Windows 98 Feature Combines TV, Terminal and the Internet," New York Times, Aug. 18, 1998.
"Yearling's Free Personalised TV Guide," from the internet at http://www.yearling.com/, Dec. 30, 1996, 15 pages.
272OR Satellite Receiver User's Guide, General Instrument, 1991, pp. 58-61.
A Financial Times Survey: Viewdata (Advertisement), Financial Times, Mar. 20, 1979.
A Financial Times Survey: Viewdata (Advertisement), Financial Times, May 20, 1979, 3 pages.
ACM Multimedia 93 Proceedings, "A Digital On-Demand Video Service Supporting Content-Based Queries," Little et al. pp. 427-436, Jul. 1993.
Addressable Converters: A New Development at CableData, Via Cable, vol. 1, No. 12, Dec. 1981.
Advertisement for "TV Decisions," Cable Vision, Aug. 4, 1986.
Aho, Debra, "New Delphi Ads Push Envelope: Starting Visuals From Upstart Agency Go Too Far for One Paper's Tastes," Advertising Age 0.0, May 30, 1994, 2 pages, Abstract.
Alexander, Michael "*Visualizing cleared-off desktops*," *Computerworld*, May 6, 1991, p. 20.
Anderson et al., UNIX Communications and the Internet (3d ed. 1995), 846 pages.
Antonoff, "Interactive Television," Popular Science, Nov. 1992, 7 pages.
Antonoff, M., "*Stay Tuned for Smart TV*," *Popular Science*, Nov. 1990, pp. 62-65.
Armstrong, "Channel-Surfing's next wave: Henry Yuen's interactive TV guide takes on TCI and Viacom," BusinessWeek, Jul. 31, 1995, 3 pages.
Arnold, "Britain to get wired city—via telephone," Electronics, Mar. 4, 1976, at 76, 3 pages.
Bach, et al., "Multimedia TV Set, Part 1" Radio-Fernsehen Elektronik (RFE), Sep. 1996, pp. 28, 30, 31, 12 pages. (English language translation attached).
Bach, et al., "Multimedia TV Set, Part 2 and Conclusion," Radio-Fernsehen Elektronik (RFE), 10/96, 11 pages. (English language translation attached.).
Baer, R.H, "Innovative Add-On TV Products," IEEE Transactions on Consumer Electronics, vol. CE-25, Nov. 1979, pp. 765-771.
Beddow, "The Virtual Channels Subscriber Interface," Communications Technology, Apr. 30, 1992, 2 pages.
Bell Atlantic Buys Cable TV Company for $22bn, Financial Times (London), Oct. 14, 1993 p. 65.
Benson, U., "*VPV Videotext Programs Videorecorder*," *IEEE Paper*, Jun. 1988, pp. 788-792.
Berniker, "TV Guide going online", Broadcasting & Cable, pp. 49-52, Jun. 13, 1994, 6 pages.
Bertuch, "New Realities for PCs: Multimedia between aspiration and commerce," (translation), Exhibit NK 12 of TechniSat's nullity action against EP'111, (1991), 12 pages.
Bestler, Caitlin "Flexible Data Structures and Interface Rituals for Rapid Development of OSD Applications," Proceedings from the Eleven Technical Sessions, 42nd Annual Convention and Exposition and Exploration of the NCTA, San Francisco, CA Jun. 6-9, 1993, pp. 223-236. Jun. 6, 1993.
Blahut et al., "Interactive Television," Proceedings of the IEEE, pp. 1071-1085, Jul. 1995.
Boyd-Merritt, "Television wires two-way video," Electronic Engineering Times, Apr. 25, 1994, 3 pages.
Brochure, "Weststar and Videotoken Network Present the CableComputer," Revised Aug. 15, 1985, 41 pages.
Brochure, Time Inc., "Now, Through the Advances of the Computer Age, You Can Get the Information You Want, When You Want It. Instantly and Conveniently, On Your Home TV Screen," Time Teletext, Time Video Information Services, Inc., 9 pages, undated (V 79167-79175).
Brochure, VTN "Videotoken Network, New Dimension Television," Dec. 1985 (Plaintiffs Exhibit 313).
Brochure, VTN "Videotoken Network, New Dimension Television," Dec. 1985, 10 pages.
Brugliera, "Digital On-Screen Display—A New Technology for the Consumer Interface," Symposium Record Cable TV Sessions of the 18th International Television Symposium & Technical Exhibition—Montreux, Switzerland, Jun. 10-15, 1993, pp. 571-586.
Buchholz et al., "Revolution auf dem Bildschirm—Die neuen Medien Videotext and Bildschirmtext," Wilhelm Goldmann Verlag, Munich, Germany, copyright 1979, pp. 24-33 and 36-39. (English language translation attached.).
Cable Computer User's Guide, Rev. 1, Dec. 1985 (Plaintiff's Exhibit 289).
Cable Computer User's Guide, Rev. 1, Dec. 1985, 4 pages.
Cable Television Equipment, Jerrold Communications Publication, dated 1992 and 1993, pp. 8-2.1 to 8-6 and 8-14.1 to 8-14.3.
CableData, Roseville Consumer Presentation, Mar. 1985 12 pages.
Came, E.B., "*The Wired Household*," *IEEE Spectrum*, vol. 16 No. 10, Oct. 1979, pp. 61-66.
Case 4:11-cv-06591-PJH, Complaint for Declaratory Relief (plaintiff), dated Dec. 21, 2011, 16 pages.
Chan, "Learning Considerations in User Interface Design: The Room Model," Publication of the Software Portability Laboratory, University of Waterloo, Ontario, Canada, Jul. 1984, 52 pages.
Chang et al., "An Open-Systems Approach to Video on Demand," IEEE Communications Magazine, May 1994, pp. 68-80.
Chen et al., "Real Time video and Audio in the World Wide Web," Proc. 4th World Wide Web Conference, 1995, 15 pages.
Cherrick et al., "An Individually Addressable TV Receiver With Interactive Channel Guide Display, VCR, and Cable Box Control", IEEE Transactions on Consumer Electronics, vol. 4:3 (Aug. 1994), pp. 317-28.
Christodoulakis, Steven and Graham, Stephen "*Browsing Within Time-Driven Multimedia Documents*," publication of the Institute for Computer Research, University of Waterloo, Waterloo, Ontario, Canada Jul. 1988 pp. 219-227.
Cleland, Kim, "Look Out MSN, Here Comes MCI," Advertising Age, vol. 66, No. 32, Aug. 14, 1995, 2 pages.
CNN Tech: Sonicblue revives ReplayTV, articles cnn.com, Sep. 10, 2001, retrieved from the internet: http://articles.cnn.com/2001-09-10/tech/replay.tv.idg_1_replaytv-sonicblue-digital-video?_s=PM:TECH, 2 pages.
Communication of a Notice of Opposition, European Patent Application No. 08103167.6, Jan. 11, 2012, 24 pages.
Complainant's Post-Hearing Brief (redacted) filed Mar. 22, 2013, 43 pages.
Complainant's Post-Hearing Reply Brief (redacted) filed Mar. 29, 2013, 21 pages.
Complainants' Opp to Netflix's MSD of Invalidity of USP '776 and Complainants' Statement of Facts filed Jan. 14, 2013, 62 pages.
Complainants' Pre-Hearing Statement (redacted) filed Feb. 8, 2013, 96 pages.
Compton et al., "Internet CNN Newsroom: A digital video news magazine and library," Proceedings of the Intl. Conf. on Multimedia Computing and Systems, Washington, May 15-18, 1995; Los Alamitos, IEEE Comp. Soc. Press, U.S., May 15, 1995, pp. 296-301, XP010154611.
Computer Network: Current Status and Outlook on Leading Science and Technology, Bureau of Science & Technology (Japan), vol. 1, Dec. 1986, 326 pages.
Contents of the website of StarSight Telecast, Inc. (http://www.StarSight.com) as of Apr. 21, 2004, 1 page.
U.S. Appl. No. 60/179,548, filed Feb. 1, 2000, 11 pages.
Cox, J. et al, "Extended Services in a Digital Compression System," Proceedings from Eleven Technical Sessions: 42nd Annual Convention and Exposition of the National Cable Television Association, Jun. 1993, pp. 185-191.

(56) **References Cited**

OTHER PUBLICATIONS

Creation/Modification of the Audio Signal Processor Setup for a PC Audio Editor, IBM Technical Disclosure Bulletin, vol. 30, No. 10, Mar. 1988, pp. 367-376.
Cue Readers, Digital: Convergence Corporation, at http://www.crq.com/rnastertempl.cfm?view=products&products=cuereader (printed Sep. 24, 2001).
D2B-Home Bus Fur Audio and Video, Selektor, Apr. 1990, pp. 10, 12, 8 total pages.
Daily, "Addressable Decoder with Downloadable Operation," Proceedings from the Eleven Technical Sessions, 42nd Annual Convention and Exposition of the NCTA, Jun. 6-9, 1993, pp. 82-89.
Damouny, "Teletext Decoders—Keeping Up With the Latest Advances," IEEE Transactions on Consumer Electronics, vol. CE-30, No. 3, Aug. 1984, pp. 429-435.
Das, D. and ter Horst, H., Recommender Systems for TV, Technical Report WS-98-08—Papers from the AAAI Workshop, Madison, WI (1998), 2 pages.
Davic 1.0 Specifications, Part 1, "Description of Davic Functionalities," Revision 3.2, Digital Audio-Visual Council, Jul. 10, 1995, 61 pages.
Davic Digital Audio-Visual Council, Davic 1.5 Specification, Baseline Document 1, Revised 4.0, Applications for Home Storage and Internet Based Systems, Published by Digital Audio-Visual Council 1995-1999, 27 pages.
Davis, TV Guide On Screen, "Violence on Television", House of Representatives, Committee on Energy and Commerce, Subcommittee on Telecommunications and Finance, pp. 93-163, Jun. 25, 1993.
Day, "The Great PC/TV Debate," OEM Magazine, Jul. 1, 1996, 6 pages.
Dec., "Presenting Java," Sams.net Publishing, published Sep. 20, 1995, 219 pages.
Defence and Counterclaim of the First and Second Defendants, No. HC11 C 04556, between Starsight Telecast and United Video Properties (Claimants) and Virgin Media, Virgin Media Payments, and TiVo (Defendants), Mar. 14, 2012, 16 pages.
Dial M for Movie, Funkschau 11/94 Perspektiven, Video on Demand, vol. Nov. 1994, 5 pages. (English language translation attached).
Dialing the printed page, ITT in Europe Profile, 11/Spring 1977, 2 pages.
Digital TV—at a price, New Scientist, Sep. 15,1983, vol. 99. No. 1375, 3 pages.
Digital Video Broadcasting (DVB); DVB specification for data broadcasting, European Telecommunication Standards Institute, Draft EN 301 192 V1.2.1 (Jan. 1999).
Dinwiddle et al., "Combined-User Interface for Computers, Televison, Video Recorders, and Telephone, etc." IBM Technical Disclosure Bulletin, vol. 33(3B), pp. 116-118 (1990), 3 pages.
Directv Plus2 System, Thompson Consumer Electronics, Inc. (1999), 2 pages.
Directv Receiver—Owner's Manual, Samsung, Directv, Inc. (2002), 118 pages.
Directv Receiver with TiVo Digital Satellite Receiver/Recorder SAT-T60- .
Directv Receiver with TiVo Installation Guide, Philips, TiVo Inc. (2000), 68 pages.
Directv Receiver with TiVo Viewer's Guide, TiVo Inc., Sony Corp. (1999, 2000), 152 pages.
DiRosa, S. "Bigsurf Netguide", Jul. 1995, vol. 3.1 (Sections 18,21, and 28—renumbered as pp. 1-27).
DishPro Satellite System—User's Guide, Dish Network (Sep. 1, 2001), 144 pages.
Does NBC Get It, Aug. 14, 1995, retrieved from the internet at http://www.open4success.org/db/bin19/019687.html, retrieved on Dec. 11, 2013, 1 page.
Dr. Dobb's, "Implementing a Web Shopping Cart," from the internet at https://www.drdobbs.com/article/print?articleId=184409959&siteSect . . . , Sep. 1, 1996, printed from the internet on Sep. 13, 2012, 15 pages.
Draft Grounds of Invalidity for EP (UK) 0 880 856 (Trial B), No. HC11 C 04556, between Starsight Telecast and United Video Properties (Claimants) and Virgin Media, Virgin Media Payments, and TiVo (Defendants), 7 pgs., Oct. 2013.
Duck Tales, (1987)[TV Series 1987-1990], Internet Movie Database (IMDB) [Retrieved on Apr. 7, 2007], 5 pages.
Eckhoff, "TV Listing Star on the Computer," Central Penn Business Journal, High Beam Research, Mar. 15, 1996, 4 pages.
Edwardson, S.M., & Gee, A., "CEEFAX: A Proposed New Broadcasting Service," Journal of the SMPTE, Jan. 1974, vol. 83 No. 1, pp. 14-19.
Ehrmantraut et al., "The Personal Electronic Program Guide—Towards the Pre-Selection of Individual TV Programs," CIKM 96, Rockville, MD., Dec. 31, 1996.
Eitz et al., "Videotext Programmiert Videoheimgerate," Rundfunktech Mitteilungen, Jahrg. 30, H.5, 1986, S. 223 bis 229, 21 pages. (English translation attached).
Eitz, Gerhard, "Zukunftige Informations-und Datenangebote beim dig italen Femsehen-EPG Und 'Lesezeichen'," RTM Rundfunktechnische Mitteilungen, Jun. 1997, vol. 41, pp. 67-72.
Electronic Program Guide via Internet, Research Disclosure, Kenneth Mason Publications, Hampshire, GB vol. 385(2) (May 1996) p. 276, ISSN:0374-4353.
Electronic Programme Guide (EPG); Protocol for a TV Guide using electronic data transmission, by European Telecommunication Standards Institute, May 1997, Valbonne, France, publication No. ETS 300 707.
Enhanced Content Specification, ATVEF, from the internet at http://www.atvetcomilibraryispec.html, printed Aug. 22, 2001, the document bears a Copyright date of 1998, 1999, 2000, 41 pages.
EP1099347 Opposition File History—Foreign Counterpart of U.S. Pat. No. 6,898,762 (priority date Aug. 21, 1998) (73 pages).
Ernst & Young "On track: A primer on media asset identification" May 2011, retrieved from the internet May 29, 2014, URL http://www.ey.com/Publication/vwLUAssets/Media_asset_identification_primer/$FILE/Media_Entertainment.pdf, 52 pages.
European Telecommunications Standards: Digital Broadcasting Systems for Television Sound and Data Services; Specification for Service Information (SI) in Digital Video Broadcasting (DVB) Systems, European Telecommunications Standards Institute, Dec. 1994, 64 pages.
Facsimile Transmission, NHK Research Monthly Report, Dec. 1987, 78 pages. (unknown author).
Fall 2001 TiVo Service Update with Dual Tuner!, TiVo Inc. (2001), 9 pages.
Fry et al., "Delivering QoS Controlled Continuous Media on the World Wide Web," Proceedings of the 4th International IFIP Workshop on QoS, Paris, Mar. 6-8, 1996, 12 pages.
Fuller, C., Streaming gijutsu no genzai Web video system no gaiyou [Current Streaming Technology, Outline of Web Video System], UNIX Magazine, Japan, ASCII K.K., Mar. 1, 2000, vol. 15, No. 3, 11 pages.
GameSpot's Downloads for Allied General, accessed from the internet at http://web.archive.org/web/19970205060703/http://www.gamespot.com/strategy/allie . . . , copyright 1997, printed on Sep. 19, 2013, 1 page.
GameSpot: Allied General—Download It Now!!!!, accessed from the internet at http://web.archive.org/web/19970206133452/http://www.gamespot.com/strategy/allie . . . , copyright 1997, printed on Sep. 19, 2013.
GameSpot: Allied General at a Glance, accessed from the internet at http://web.archive.org/web/19970205153530/http://www.gamespot.com/strategy/allie . . . , copyright 1996, printed on Sep. 19, 2013.
Garneau, "Information Highway in Quebec," Editor & Publisher, vol. 127, No. 5, Jan. 29, 1994, 4 pages.
Gateway Destination: The PC for the Office and the Family Room, PC Magazine, First Looks section, pp. 39-41, Jun. 11, 1996, 3 pages.
Gavron, Jacquelyn, Moran, Joseph, How to Use Microsoft Windows NT 4 Workstation, 1996, entire document, 5 pages.
Gemstar Development Corporation, VCR plus +, 1990 pp. 1-6.
Getting Started Installation Guide, Using StarSight 1 Manual, and Remote Control Quick Reference Guide, copyright 1994, 93 pages.

(56) **References Cited**

OTHER PUBLICATIONS

GoCode, The Code Corporate at http://www.gocode.com/products/reader.htm (printed Sep. 24, 2001).
Goff, Leslie, "Subs Find Lots of Program Guides Online," Multichannel News, vol. 17, No. 19, May 6, 1996, p. 38, Abstract, 3 pages.
Google News Archives—printout, received at the EPO on Mar. 22, 2007, 2 pages.
Grounds, facts and Evidence in Support of Opposition to EP-1961228 (Dec. 11, 2011; 22 pages).
Growing US interest in the impact of viewdata, Computing Weekly, Jul. 20, 1978, 1 page.
Gutta, Srinivas et al., "TV Content Recommender System", Proceedings of the Seventeenth National Conference on Artificial Intelligence and Twelfth Conference on Innovative Applications of Artificial Intelligence, (Jul. 30, 2000),2 pages.
Hallenbeck, P., Developing an interactive television system that works, R&D Magazine, vol. 39:7, Jun. 1997, 4 pages.
Harada, Mamoru et al., "Internet de telebi housou ga hajimaru," ("Television Broadcasting Starts with the Internet"), Nikkei Electronics, Japan, Nikkei BP, No. 653, Jan. 15, 1996, 14 pages. (Concise explanation included in IDS letter.).
Hartwig et al. "Broadcasting and Processing of Program Guides for Digital TV," SMPTE Journal, pp. 727-732, Oct. 1997.
Hauptmann et al., "News on Demand," News-on-Demand: An Application of Informedia® Technology D-Lib Magazine, Sep. 13, 1995, XP002675162, Retrieved from the Internet: URL:http://www.dlib.org/dlib/september95/nod/page3.html [retrieved on May 2, 2012], 1 page.
Hedger, "Telesoftware: Home Computing Via Broadcast Teletext," IEEE Transactions on Consumer Electronics, vol. CE-25, No. 3, Jul. 1979, 11 pages.
Hendrix, "A Natural Language Interface Facility", Artificial Intelligence Center, Stanford Research Institute, SIGART Newsletter, No. 61, Feb. 1977, 2 pages.
Hill, et al., "Recommending and Evaluating Choices in a Virtual Community of Use" CHI '95 Mosaic of Creativity, pp. 194-201 (1995).
Hitachi Consumer Electronics Co., Ltd., Certification of market introduction in 1993 of Hitachi Projection TV Model 55EX7K, Dec. 17, 2012, 1 page.
Hitachi Projection Color TV Operating Guide, for Models 55EX7K, 50EX6K, 50ES1B/K, and 46EX3B/4K, 38 pages, undated.
Hitachi Service Manual, No. 0021, Projection Color Television, Models 55EX7K, 50EX6K, 50ES1B/K, 46EX3B/4K, and 46EX3BS/4KS, Aug. 1993, 1 page.
Hoarty, "Multimedia on Cable Television Systems," Symposium Record Table TV Sessions, 18th International Television Symposium and Technical Exhibition, Montreux, Switzerland, Jun. 10, 1993, 22 pages.
Hobbes Internet Timeline, Mar. 22, 2007.
Hobbes' Internet Timeline 10.2, by Robert H'obbes' Zakon, from the internet at http://www.zakon.org/robert/internet/timeline/, printed from the internet on Sep. 13, 2012, 29 pages.
Hofmann, Neumann, Oberlies & Schadwinkel, "Videotext Programmiert Videorecorder," Rundfunktechnischen Mitteilungen, (Broadcast Engineering Reports), vol. 26 No. 6, pp. 254-257, Nov.-Dec. 1982.
Holland, "NAPLPS standard defines graphics and text communications," EDN, Jan. 10, 1985, 11 pages.
Iitusuka, Honbashi, Kuwana, Building Internet TV Guide Service 1 and 2, the 53rd National Conference Proceedings, Japan, Information Processing Society of Japan, Sep. 6, 1996 p. 3-227 to 230.
Iizuka et al., "The Overview of Internet TV Guide Japan—1 and 2," the 53rd National Conference Proceedings, Japan, Information Processing Society of Japan, Sep. 6, 1996, 4 pages. (Concise explanation included in IDS letter.).
Ikejiri, Minoru et al., "Maruchimedia wo riido suru apurikeishon kaihatu," ("Application Development for Leading Multimedia"), Journal of NTT Technologies, Japan, The Telecommunications Association of Japan, vol. 7, No. 9, Sep. 1, 1995, pp. 48-55. (Concise explanation included in IDS letter.).
Imke, S., Interactive Video Management and Production, Educational Technology Publications, May 1991, http://www.amazon.com/Interactive-Video-Management-Production-Steven/dp/0877782334/ref=sr_1_1?ie=UTF8&qid=1416426739&sr=8-1&keywords=interactive+video+management+and+production&pebp=1416426742553, 2 pages.
Installation Guide, "Getting Started 1" Manual, and Remote Control "Quick Reference Guide".
Instruction Manual, "Using StarSight 2," StarSight Telecast, Inc., 1994, 27 pages.
Instruction Manual, "Using StarSight 2," StarSight Telecast, Inc., StarSight CB 1500 Customer Letter, 1994.
Instructional Manual, "Sonic the Hedgehog," Sega of America, 1992, 11 pages.
Interactive Computer Conference Server, IBM Technical Bulletin, vol. 34, No. 7A, Dec. 1991, pp. 375-377.
Interface Device for Conventional TVs to Improve Functionality, IBM Technical Disclosure Bulletin, vol. 36, No. 7, Jul. 1993, pp. 53-54.
Internet User Forecast by Country, Computer Industry Almanac—Press Release, from the internet at http://www.c-i-a.com/internetusersexec.html, printed from the internet on Sep. 13, 2012, 3 pages.
IPG Attitude and Usage Study, prepared by Lieberman Research Worldwide for Gemstar-TV Guide International, Oct. 2002, 99 pages.
Irven, "Multi-Media Information Services: A Laboratory Study," IEEE Communications Magazine, vol. 26, No. 6, Jun. 1988, pp. 27-33 and 36-44.
Ishii et al, "Toward an Open Shared Workspace: Computer and Video Fusion Approach of Team Workstation," Communications of the ACM, Dec. 1991, vol. 34 No. 12, pp. 37-50.
Ishii, Hiroshi et al, "Clearface: Translucent Multiuser Interface for TeamWorkStation," ECSCW, Sep. 1991, 6 pages.
James Sorce, David Fay, Brian Raila and Robert Virzi, "Designing a Broadband Residential Entertainment Service: A Case Study," GTE Laboratories Incorporated, undated, pp. 141-148.
James, A., "*Oracle—Broadcasting the Written Word*," *Wireless World*, Jul. 1973, vol. 79 No. 1453, pp. 314-316.
Judice, "Move Over Cable, Here Comes Video Via Voice Lines," Network World, Sep. 1986, 3 pages.
JVC Service Manual, 27" Color Monitor/Receiver, Model AV-2771S (U.S.), Jul. 1991, 89 pages.
Kai et al., Development of a Simulation System for Integrated Services Television, Report from Information Processing Society of Japan, Japan, Sep. 13, 1996, vol. 96, No. 90 p. 13-20.
Karstad, K., "Microprocessor Control for Color-TV Receivers," IEEE Transactions on Consumer Electronics, vol. CE-26, May 1980, pp. 149-155.
Karunanithi, et al., "A Feature-Based Neural Network Movie Selection Approach," Proc. Intl. Workshop on Applications of Neural Networks to Telecommunications, Stockholm, Sweden, May 22-24, 1995, pp. 162-169.
Katkere et al., "Interactive Video on WWW: Beyond VCR-like Interfaces," Computer Networks and ISDN Systems, vol. 28, Issue 11, 1996, pp. 1559-1572.
Khoo et al., "An Expert System Approach to Online Catalog Subject Searching," Information Processing & Management: An International Journal, vol. 30, No. 2, 1994, pp. 223-238.
Kojima, Akira et al., "Implementation Measures to Expand Metadata Application Services", http://www/ntt.co.jp/tr/0306/files/ntr200306051.pdf. (Jun. 2003), 6 pages.
Komarinski, Anonymous FTP p. 1, May 1, 1995 Linux Journal, 5 pages.
Kornhaas, W., "*Von der Textprogrammierung uber TOP zum Archivsystem*," *Radio Fernsehen Elektronik*, vol. 40, No. 8, Aug. 30, 1991, pp. 465-468, XP 000240875 Veb Verlag Technik. Berlin, DE ISSN: 1436-1574.
Large, "Throw away the books—Viewdata's coming," Guardian, Jan. 10, 1978, 1 page.

(56) **References Cited**

OTHER PUBLICATIONS

Large, "Viewdata, the invention that brings boundless advice and information to the home, also sets a test for the Post Office," Financial Guardian, Jun. 20, 1978, 3 pages.
Lee, Hee-Kyung et al., "Personalized Contents Guide and Browsing based on User Preference", http://vega.icu.ac.kr/~mccb-lab/publications/Paper/PersonalizedTV(2002).pdf, (2002), 10 pages.
Leftwich, Jim & Schein, Steve, *StarSight Interactive Television Program Guide, Phase III*, Functional/Interactional Architecture Specification Document, Orbit Interaction, Palo Alto, California.
Leftwich, Jim, Lai, Willy & Schein, Steve, *StarSight Interactive Television Program Guide, Phase IV*, Functional/Interactional Architecture Specification Document, Orbit Interaction, Palo Alto, California, published before Apr. 19, 1995.
Letter from StarSight Telecast, Inc. to a StarSight IPG subscriber (with subscriber name, address and account number redacted) notifying the subscriber of termination of the StarSight IPG, 2003, 1 page.
Listing of computer code for operating system within the Cable Computer in 1985, 97 pages.
Listing of computer code for Video HTU Program (Plaintiff's Exhibit 299).
Listing of computer code for Video HTU Program, 1 page.
Lists> What's On Tonite! TV Listings (fwd), Internet article (On line), Jan. 28, 1995, XP 002378869 Retrieved from the Internet: URL: www.scout.wisc.edu/Projects/PastProjects/NH/95-01-31/0018.html> [Retrieved on Apr. 28, 2006]. The whole document, 4 pages.
Little et al., "Prospects for Interactive Video-on-Demand," IEEE Multimedia, Fall 1994, pp. 14-24.
Lloyd, "Impact of technology," Financial Times, Jul. 1978, 2 pages.
Loen et al., "Subscriber Terminal Units for Video Dial Tone Systems," IEEE Network, Sep./Oct. 1995, 10 pages.
Lowenstein, R.L. and Aller, H.E., "*The Inevitable March of Videotex*," *Technology Review*, vol. 88, Oct. 1985, p. 22.
Lynch, Keith, timeline of net related terms and concepts, Mar. 22, 2007, 8 pages.
M-A-Com, Inc., "Videocipher II Satellite Descrambler Owner's Manual," dated Prior Feb. 1986, pp. 1-17.
M/A-Com, Inc., "Videocipher II Satellite Descrambler Owners Manual," dated Feb. 1986, pp. 1-24.
Make Room for POP, Popular Science, Jun. 1993, 5 pages.
Mannes, "List-Mania, On-Screen, interactive TV guides that can program your VCR are just around the corner," Video Review, May 1992, 4 pages.
Mannes, "Smart Screens: Development of Personal Navigation Systems for TV Viewers," Video Magazine, Dec. 1993, 6 pages.
Mar. 19, 1985 letter from G. Knapp of CableData to R. Hansen of Weststar Communications, Inc. 6 pages.
Markowitz, "Companies Jump on Interactive Bandwagon," Discount Store News, Dec. 6, 1993, 3 pages.
McKenzie, G.A., "*Oracle—An Information Broadcasting Service Using Data Transmission in the Vertical Interval*," *Journal of the SMPTE*, Jan. 1974, vol. 83 No. 1, pp. 6-10.
Melton, "The Uniden Super 4800," OnSat magazine, Jun. 10-16, 1990, 4 pages.
Merrell, R.G., "Tac Timer," 1986 NCTA Technical Papers, pp. 203-206.
Miller, "A Scenario for the Deployment of Interactive Multimedia Cable Television Systems in the United States in the 1990s," IEEE, vol. 82:(4), 1994, 5 pages.
Money, "Teletext and Viewdata," Butterworth & Co. Ltd., London, 1979, 159 pages.
Mosley, J.D., "NAPLPS chip sets, though scarce, satisfy limited US videotex demand," EDN, Mar. 21, 1985, at p. 57, 4 pages.
Motohashi, lizuka, Kuwana, Building Internet TV Guide Service 1 and 2, the 53rd National Conference Proceedings, Japan, Information Processing Society of Japan, Sep. 6, 1996, 5 pages [english translation].
MSI Datacasting Systems, TV Communications Journal, Jan. 1973, 2 pages.
Neumann, Andreas, "WDR Online Aufbau and Perspektiven Automatisierter Online Dienste im WDR," RTM Rundfunktechnische Mitteilungen, vol. 41, Jun. 1997, 45 pages.
Nikkei Click, You can do it now with your existing computer, Nikkei Business Publications, Inc., Aug. 8, 2000, vol. 7, No. 11, pp. 185-188 (No US Translation), 8 pages.
Oberlies, et al.; "VPS-Anzeige Und Uberwachungsgerat", Rundfunktechnische Mitteilungen, vol. 30, No. 1 Jan. 1986-Feb. 1986, Norderstedt (DE).
Okimi, Katsuya et al., "Shinban ISDN," ("New ISDN Edition"), Japan, Ohmsha, Ltd., First Edition, Oct. 5, 1995, 27 pages (Concise explanation included in IDS letter).
Open TV fur interaktives Fernsehen, Trend and Technik, 9 -95 RFE, retrieved from the internet Sep. 2, 2006, 4 pages (English language translation attached).
Open TV Launches OpenStreamer TM Technology for Broadcasters to Deliver First Ever Real-Time Digital Interactive Television, from the internet at http://www.opentv.corn/news/openstreamer_press_final.htm, printed on Jun. 28, 1999, the document bears a copyright date of 1999, 2 pages.
Order No. 40 Denying Summary Determination Motion filed Apr. 5, 2013, 6 pages.
Owen, "How dial-a-fact is coming closer to home," The Times, Sep. 30, 1977, 2 pages.
Owen, "Why the Post Office is so excited by its plans for a TV screen information service," The Times, Sep. 26, 1976, 4 pages.
Panasonic TX-33A1G Operating Instructions (undated), 33 pages.
Paperclick, NeoMedia Technologies, Inc., at http://www.paperclick.com/How works,htm (printed Sep. 24, 2001).
Periodical RFE, vol. 9'95, p. 100: Trend and Technology Open TV for Interactive Television.
Pfister, Larry T., "Teletext: Its Time Has Come," Prepared for the IGC Videotext/Teletext Conference, Andover, Massachusetts, Dec. 14, 1982, pp. 1-11.
Philips TV Set, model No. 25 PT 910A, User Manual; 40 pages (undated).
Poole, "Demand for Viewdata grows," Sunday Times, Feb. 10, 1977, 3 pages.
Postel, J., Reynolds, J., Request for Comments: 959 File Transfer Protocol, Oct. 1985, 70 pages.
Prevue Guide Brochure, Spring 1984, 2 pages.
Prevue Guide Brochure, Spring 1994, 22 pages.
Prevue Networks and OpenTV(R) Agree to Work Together on Deploying Interactive Program Guides Worldwide, from the internet at http://www.opentv.com/news/prevuefinal.htm, printed on Jun. 28, 1999, 2 pages.
Prevue Networks, Inc. Promotional Materials (undated), 22 pages.
Probe XL Brochure, Auto Tote Systems Inc., (Newark, Delaware) (undated) 57 pgs.
Prodigy Launches Interactive TV Listing, Apr. 22, 1994, Public Broadcasting Report, 1 page.
PTV Recorder Setup Guide, Philips Electronics, TiVo Inc. (2000), 68 pages.
Qayyum, "Using IVDS and VBI for Interactive Television," IEEE, Jun. 10, 1996, 11 pages.
Rajapakshe et al., "Video on demand," (last modified Jun. 1995) <http://www-dse.doc.ic.ac.uk/~nd/suprise_95 /Journal/vol4/shr/report.html>, 14 pages.
Ramachandran, "Space-Time Memory: a parallel programming abstraction for interactive multimedia applications, SIGPLAN Notices", vol. 34:8 (Aug. 1999), pp. 183-92.
Rath et al., "Set-Top Box Control Software: A Key Component in Digital Video," Philips Journal of Research, vol. 50, No. 1/2 1996, 8 pages.
Rayers, D.J., "*Telesoftware by Teletext*," *1984 IEEE Conference Papers*, vol. 240, p. 323.
RCA Satellite Receiver User's Guide, Thomson Multimedia Inc. (2001), 80 pages.
Replay TV 5000 series manual, 2002, entire document.
Respondents' Corrected PHS (Parts 1 and 2) (redacted) filed Feb. 25, 2013, 87 pages.

(56) **References Cited**

OTHER PUBLICATIONS

Respondents' Notice of Prior Art and Exhibit filed Oct. 12, 2012, 31 pages.
Respondents' Post-Hearing Statement (redacted) filed Mar. 22, 2013, 50 pages.
Robertson, "Reaching Through Technology," CHI '91 Conference Proceedings, Apr. 27-May 2, 1991, 6 pages.
Rogers, "Telcos vs. Cable TV: The Global View With Markets Converging and Regulatory Barriers Falling, Service Carriers Are Ready to Rumble," Data Communications, Sep. 21, 1995, vol. 24, No. 13, pp. 75-76, 78, 80, XP000526196, 8 pages.
Roizen, Joseph "*Teletext in the USA*," *Society of Motion Picture and Television Engineers Journal*, Jul. 1981, pp. 602-610.
Rosch, "New data and information system set for commercial market trial," Telephony, Mar. 20, 1978, 4 pages.
Roseville City Council Presentation, Mar. 13, 1985 (Defendant's Exhibit 226).
Roseville City Council Presentation, Mar. 13, 1985, 12 pages.
Ross Peddicord, "New on TV: You Bet Your Horse," The Sun, Baltimore Maryland, Dec. 15, 1994, 1 pg.
Ruffler et al., "InfoRadio on Demand, WebTV and digiTaz—Telecommerce Case Studies," 3rd International Workshop on Community Networking, 1996, May 23-24, 1996, 8 pages.
Ryan, "Interactive TV Takes a Corporate Twist," Electronic Engineering Times, Jul. 10, 1995, 3 pages.
Ryan, K., "Free Interactive TV Guide," Google Newsgroup, Alleged Date Sep. 29, 1995, 1 page.
Saito, Takeshi, et al., "Homenetwork Architecture Considering Digital Home Appliance," Technical Committee meeting of The Institute of Electronics, Information and Communication Engineers (IEICE), Japan, Nov. 6, 1997, vol. 97, No. 368, p. 57-64.
Sandringham, "Dress rehearsal for the PRESTEL show," New Scientist, Jun. 1, 1978, 3 pages.
Sato, T. et al., WWW jou no eizou browsing kikou no teian to Jitsugen [A Proposal for A Video Browsing Mechanism on World Wide Web and its Implementation], Japan Society for Software Science and Technology, collection of 14th convention articles, Japan, Japan Society for Software Science and Technology, Sep. 30, 1997, 6 pages.
Savage, "Internet's 'What's on Tonite!' Tells You Just That and More," The News, InfoWatch, May 29, 1995, 1 page.
Schauer, Tom, No subject, (tschauer@moscow.com) Thu, Sep. 28, 1995 16:46:48-700, XP-002378870 [Retrieved from the Internet Apr. 28, 2006], 1 page.
Schauer: Internet Article, [Online] Sep. 28, 1995, XP002378870, Retrieved from the Internet: URL: www.vision2020.moscow.com/Archives/1995/9509/0058.htlm> [retrieved on Apr. 28, 2006].
Schlender, B.R., "*Couch Potatoes! Now It's Smart TV*," *Fortune*, Nov. 20, 1989, pp. 111-116.
Schmuckler, Eric "A marriage that's made in cyberspace (television networks pursue links with online information services)," May 16, 1994 Mediaweek, vol. 4, No. 20, 5 pages.
Sealfon, Peggy, "High Tech TV," Photographic, Dec. 1984, 2 pages.
Selected pages from the "BBC Online—Schedules" web page. This web page is located at http://www.bbc.co.uk/schedules/ (as printed from the Internet on Oct. 19, 1999 and being dated as early as May 24, 1997, 6 pages.
Sharpless et al., "An advanced home terminal for interactive data communication," Conf. Rec. Int. Conf. Commun. ICC '77, IEEE, Jun. 12-15, 1977, 6 pages.
Soin et al., "Analogue-Digital ASICs", Peter Peregrinus Limited, 1991, 9 pages.
Split Personality, Popular Science, Jul. 1993, at p. 52, 5 pages.
StarSight CB 1500 Customer Letter, 1994, 1 page.
StarSight Interactive Television Program Guide III Jim Leftwich and Steve Schein, Functional/Interactional Architecture Specification Document, Orbit Interaction, Palo Alto, California, Published before Apr. 19, 1995.
StarSight Interactive Television Program Guide IV, Jim Leftwich and Steve Schein, Functional/Interactional Architecture Specification Document, Orbit Interaction, Palo Alto, California, Published before Apr. 19, 1995.
StarSight Interactive Television Program Guide, Jim Leftwich, Willy Lai & Steve Schein Published before Apr. 19, 1995.
StarSight Operating Guide and Quick Reference, 19 sheets (undated).
StarSight Telecast, StarSight introduces TVGuide-like programmer for homes, 1994, 1 page.
Start Here, Sony, TiVo and DIRECTV (undated), 8 pages.
Statement in an Examination Report dated Aug. 2, 1999 for a counterpart foreign application filed in New Zealand in which the foreign Examiner alleges that he has used "the Internet to access television listings for BBC World television as far back as mid 1996 . . . ", 2 pages.
Stickland, D.C., "It's a common noun," The Economist, Jun. 5, 1978, 1 page.
Stokes, "The viewdata age: Power to the People," Computing Weekly, Jan. 1979, 2 pages.
STORit, Report on the IBC'99 Demonstration, Deliverable #8 AC312/phi/prl/ds/p/008b1 Oct. 1999, 35 pages.
Sunada, et al, "Teletext Color Television Receiver Model C-29M950, C26M940," NEC Home Electronics, NEC Giho, 1987, 16 pages.
Super-TVs, Popular Science, Jul. 1985, at p. 64, 7 pages.
SuperGuide On Screen Satellite Program Guide, User's Guide, Owner's Manual, and sales literature, 74 pages (undated).
SuperGuide/Uniden 4800, "A Quick Guide to Programming the Uniden 4800—Dealer Set-Up Manual," undated, 8 pages.
SuperGuide/Uniden 4800, "A User's Guide to SuperGuide's™ Features," undated, 12 pages.
Sussman, "GTE Tunes In to Home TV Shopping," PC Week, vol. 5(26), Jun. 28, 1988, 2 pages.
Symposium Record Cable Sesssions, "Digital On-Screen Display of a New Technology for the Consumer Interface," Publication Date May 1993, 17 pages.
Tech Notes: Product Updates from M/A-Com Cable Home Group, "Videocipher Owners Manual Update," Issue No. 6, Feb. 1986, 19 pages.
Technical White Paper, "Open TV™ Operating Environment," (© 1998 OpenTV Inc.), pp. 1-12.
Technological Examination & Basic Investigative Research Report on Image Databases, Japan Mechanical Engineering Organization Int'l Society for the Advancement of Image Software, Japan, Mar. 1988, 127 pages.
Technology Overview for TV Guide On Screen Information Sheets, 9 pages (undated).
Technology: Turn on, tune in and print out—An experimental interactive television service is set to alter our viewing habits, Financial Times (London), Oct. 14, 1993, p. 11.
Teletext presents the alternative view, Financial Times, Oct. 24, 1977, 2 pages.
The clickTV television program guide website of TVData of Queensbury, New York. This website is located at www.clicktv.com (as printed from the Internet on Aug. 13, 1997), 5 pages.
The Columbia House Video Club: Download Software, accessed from the internet at http://web.archive.org/web/19961223163101/http://www.columbiahouse.com/repl/vc . . . , copyright 1996, printed on Sep. 19, 2013, p. 1.
The InfoBeat television program guide website of InfoBeat, Inc. This website is located at www.infobeat.com (as printed from the Internet on Dec. 8, 1997), 46 pages.
The New Media and Broadcast Policy: An Investigation & Research Conference Report on Broadcasting Diversification, Radio Regulatory Bureau, Japan Ministry of Posts & Telecommunications, Mar. 1982, 114 pages.
The television program guide website of Gist Communications, Inc. of New York, New York. This website is located at www.gist.com (as printed from the Internet on Aug. 14, 1997), 133 pages.
The television program guide website of TV Guide Entertainment Network. This website is located at www.tvguide.com (as printed from the Internet on Aug. 13-18, 1997) pp. 139.

(56) **References Cited**

OTHER PUBLICATIONS

Thomas, "Electronic Program Guide Applications—The Basics of System Design," NCTA Technical Papers, 1994, pp. 15-20.
Three men on a Viewdata bike, The Economist, Mar. 25, 1978, pp. 1-2.
Today's Stop: What's On Tonite, Oct. 3, 1995, retrieved from the internet at http://internettourbus.com/arch/1995/TB100395.TXT, 3 pages.
Tol, et al., "Requirements and Scenarios for the Bi-directional Transport of Metadata", TV Anytime Meeting, Version 1.0, Document TV150,(Aug. 2, 2002),7 pages.
TV Guide movie database Internet web pages printed on Aug. 12, 1999 (9 pages).
TV Guide on Screen prior Use Transcript of Proceedings—"Violence on Television," House of Representatives, Committee on Energy and Commerce, Subcommittee on Telecommunications and Finance, Jun. 25, 1993, 36 pages.
TV Guide Online Set for Fall, Entertainment Marketing Letter, Aug. 1994, p. 1.
TV Listings Functional Spec., Time Video Information Services, Inc., 11 pages, undated.
Ueda, Hirotada et al, "Impact: An Interactive Natural-Motion-Picture Dedicated Multi-Media Authoring System," Communications of the ACM, Mar. 1991, pp. 343-350.
Uniden, UST-4800 Super Integrated Receiver/Descrambler, Preliminary Reference Manual, 80 pages, Novermber 12, 1991.
Uniden, UST-4800, Integrated Receiver/Descrambler, Installation Guide, 60 pages, ©1990, Uniden America Corporation.
User's Guide RCA Color TV with TV Plus + Guide, Thomson Consumer Electronics(1997), 88 pages.
UVSG Offers System-Specific Web Site Development for OPS, press release of United Video Satellite Group, Apr. 12, 1996, 2 pages.
UVSG Teams With Microsoft on Internet Information Server, press release of United Video Satellite Group, Feb. 22, 1996, 2 pages.
Various publications of Insight Telecast, 1992 and 1993, 10 pages.
Veith, R.H., "Television's Teletext," Elsevier Science Publishing Co., Inc, 1983, pp. 13-20, 41-51.
Verknupfung Von TV Mit Internet, Forschung & Entwicklung, vol. 68, No. 18, Aug. 16, 1996, 5 pages.
Verlag, Wilhelm Goldmann, Revolution on the Screen, 2nd Ed. 1979, 17 pages. (English Translation).
Video Plus+, Gemstar Development Limited, at http://www.gernstarco.ukien/videoplus/intromain.html (printed Sep. 24, 2001).
Video Plus, Billboard, vol. 98, No. 4, Jan. 25, 1986, at p. 25, 4 pages.
Videocipher Stipulation, May 1996, 5 pages.
VideoGuide, "VideoGuide User's Manual," pp. 1-28 (p. 11 is the most relevant).
Viewdata and its potential impact in the USA: Final Report/vol. One, The UK Experience, Link and Butler Cox & Partners Limited, Oct. 1978, 129 pages.
Viewdata moves in US but GEC may lose out, Computing Weekly, Jan. 25, 1978, 1 page.
Vision/1 from Tecmar, IBM transforms PS/1 into a TV, Info World, vol. 14(9), Mar. 2, 1992, at p. 34, 3 pages.
Waldo, Jim, "JiniTM Architecture Overview," from the Internet at http://Java.sun.com/products/jini/whitepapers/architectureoverview.pdf/ printed on Jan. 25, 1999. The document bears a copyright date of 1998, 18 pages.
Web TV and Its Consumer Electronics Licenses debut First Internet Television Network and Set Top Box XP 002113265 Retrieved from the Internet: <URL http://www.webtv.net/company/news/archive/License.html> Jul. 10, 1996, 6 pages [retrieved on Dec. 1, 2005].
Welcome to Columbia House Online, accessed from the internet at http://web.archive.org/web/19961221085121/http://www.columbiahouse.com/, copyright 1996, printed on Sep. 19, 2013, 1 page.
Whale, "Identification of Program Similarity in Large Populations," The Computer Journal, vol. 33, No. 2, 1990, pp. 140-146.
Whitehorn, "Viewdata and you," Observer, Jul. 30, 1978, 1 page.
Wikipedia article on CompuServe, Mar. 22, 2007, 7 pages.
Wikipedia article, "Geschichte des Internets," from the internet at http://de.wikipedia.org/wiki/Geschichte_des_Internets, page last modified on Apr. 28, 2012, printed from the internet on May 18, 2012, 17 pages (Concise explanation included in IDS letter).
Wikipedia article, "Internet Explorer," from the internet at http://de.wikipedia.org/wiki/Internet_Explorer, page last modified on Sep. 9, 2012, printed from the internet on Sep. 13, 2012, 14 pages (Concise explanation included in IDS letter).
Wikipedia article, "MSN TV," from the internet at http://en.wikipedia.org/wiki/MSN_TV, page last modified on May 15, 2012, printed from the internet on Sep. 13, 2012, 10 pages.
Wikipedia article, "NCSA Mosaic," from the internet at http://de.wikipedia.org/wiki/NCSA_Mosaic, page last modified on Sep. 3, 2012, printed from the internet on Sep. 13, 2012, 2 pages (Concise explanation included in IDS letter).
Wikipedia article, "TVGN," from the internet at http://en.wikipedia.org/wiki/TVGN, page last modified on Nov. 17, 2014, printed from the internet on Nov. 18, 2014, 12 pages.
Wikipedia-Teletext Excerpt (English Translation), printed from the internet Jul. 1, 2013, 18 pages.
Williams, David M., and Perry, Burt, "Rich Online Services as the Archetype for Interactive TV," Cable '94, Proceedings from Twelve Technical Sessions, 43rd Annual Convention and Exposition of the National Cable Television Association, May 22-25, 1994, New Orleans, LA., Technical Paper Compiled by Katherine Rutkowski, National Cable, XP008161201, pp. 21-35.
Windows 98 Feature Combines TV, Terminal and the Internet, New York Times, Aug. 18, 1998.
Winkler, M., "Computer Cinema: Computer and video: from TV converter to TV studio," Computerkino, (translation) Exhibit NK 13 of TechniSat's nullity action against EP'111, 14 pages (1992).
Wittig et al, "Intelligent Media Agents in Interactive Television Systems," Proceedings of the International Conference on Multimedia Computing and Systems, Los Alamitos, CA, US, May 15-18, 1995, pp. 182-189, XP 000603484.
Wolfe, Alexander, "Beyond the SIPC," Electronic Engineering Times, No. 910, Jul. 15, 1996, 2 pages, Abstract.
Wolfe, Alexander, "Microsoft Poses PC Specs.," Electronic Engineering Times, Jul. 8, 1996, Abstract, 2 pages.
Yarrow, "The Media Business; Pay-Per-View Television is Ready for Takeoff," The New York Times, Archives, Nov. 14, 1988, 3 pages.
Yoshida, "Interactive TV a Blur," Electronic Engineering Times, Jan. 30, 1995, 2 pages.
Zakon, "Hobbes' Internet Timeline 10.2," http://www.zakon.org/robert/internet/timeline, retrieved Sep. 13, 2012.

* cited by examiner

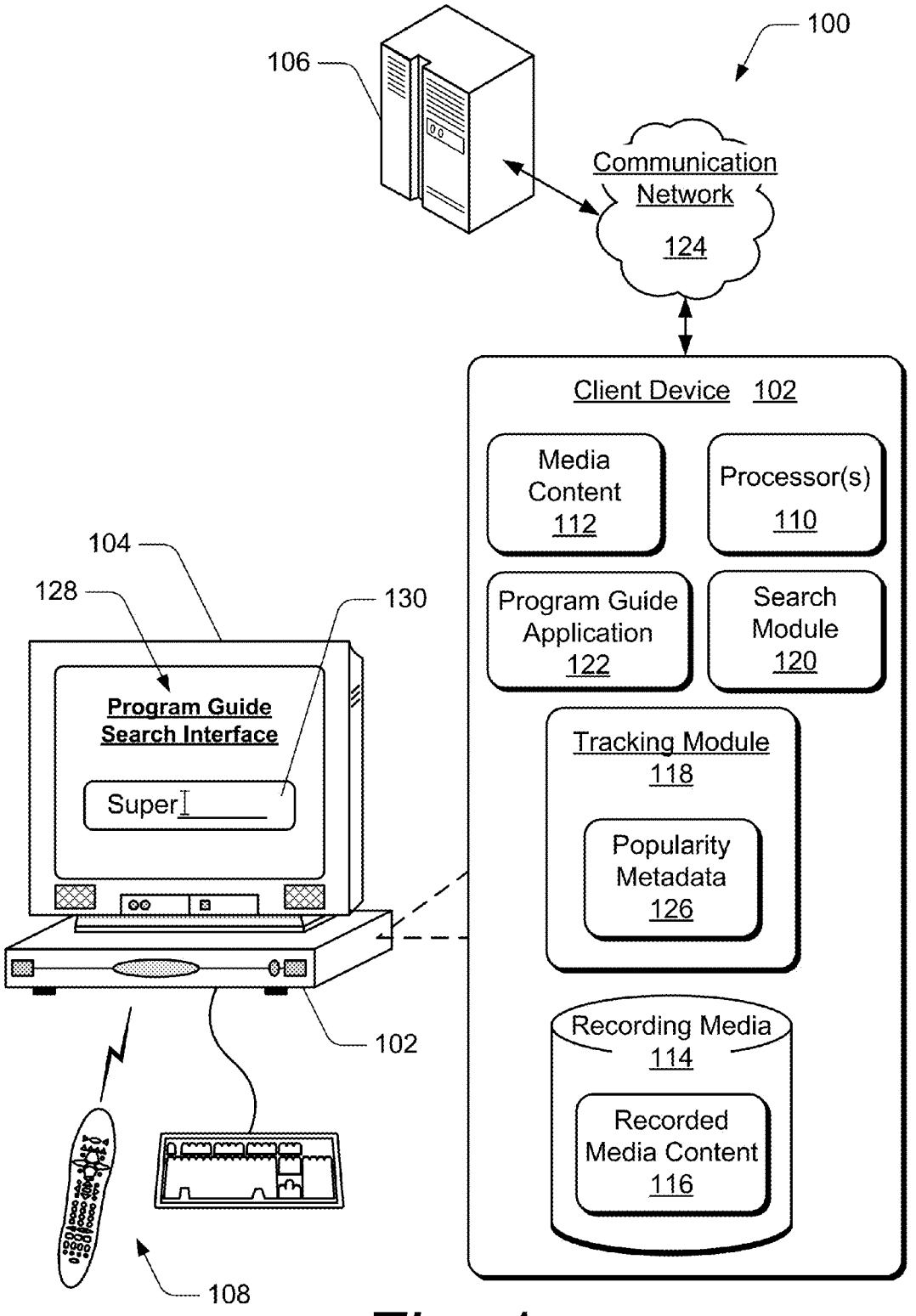

100
106
Communication Network
124
Client Device 102
Media Content 112
Processor(s) 110
Program Guide Application 122
Search Module 120
Tracking Module 118
Popularity Metadata 126
Recording Media 114
Recorded Media Content 116
104
128
130
Program Guide Search Interface
Super
102
108

Fig. 1

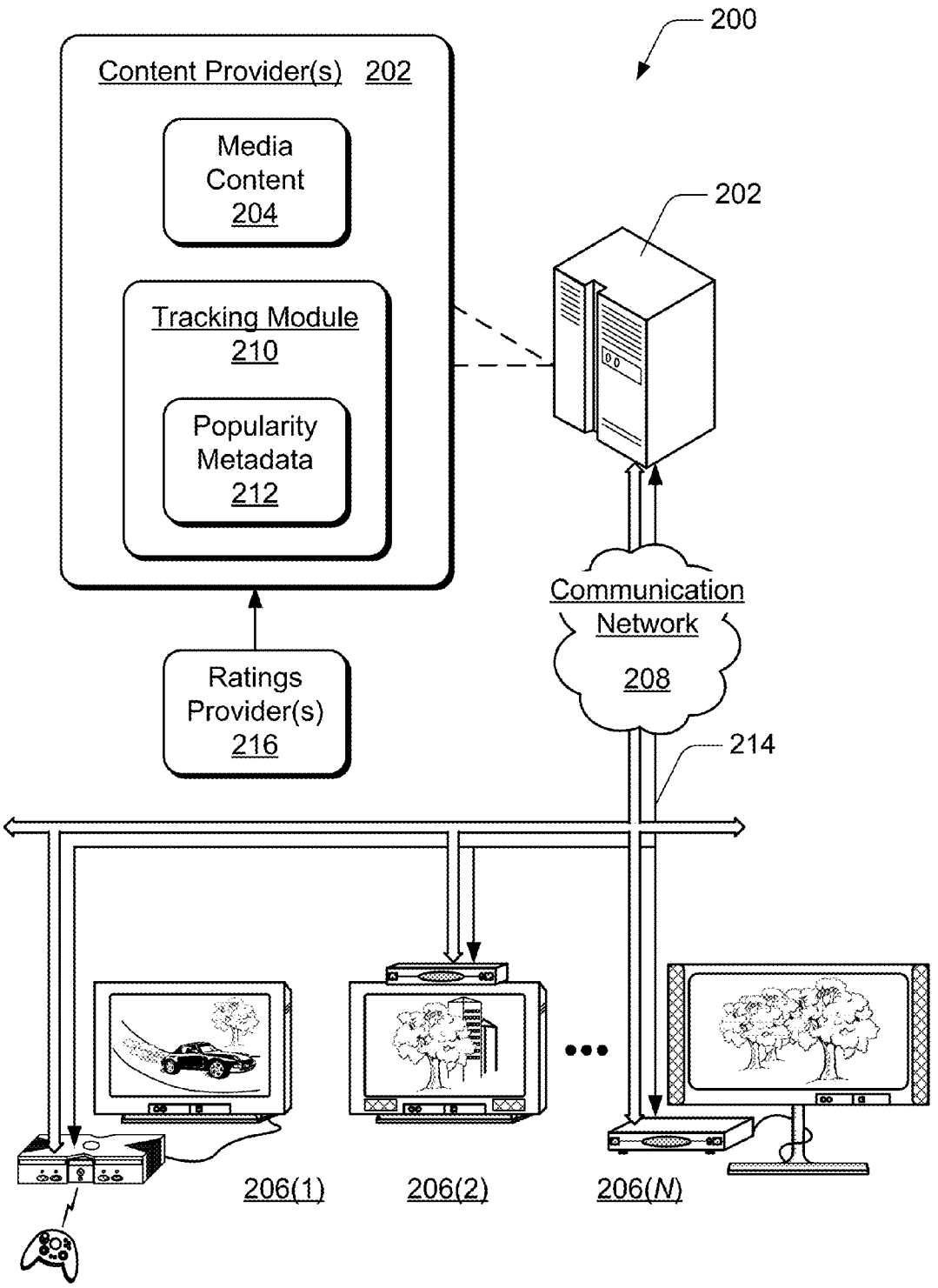

200
Content Provider(s) 202
Media Content 204
Tracking Module 210
Popularity Metadata 212
202
Communication Network 208
Ratings Provider(s) 216
214
206(1)
206(2)
206(N)

Fig. 2

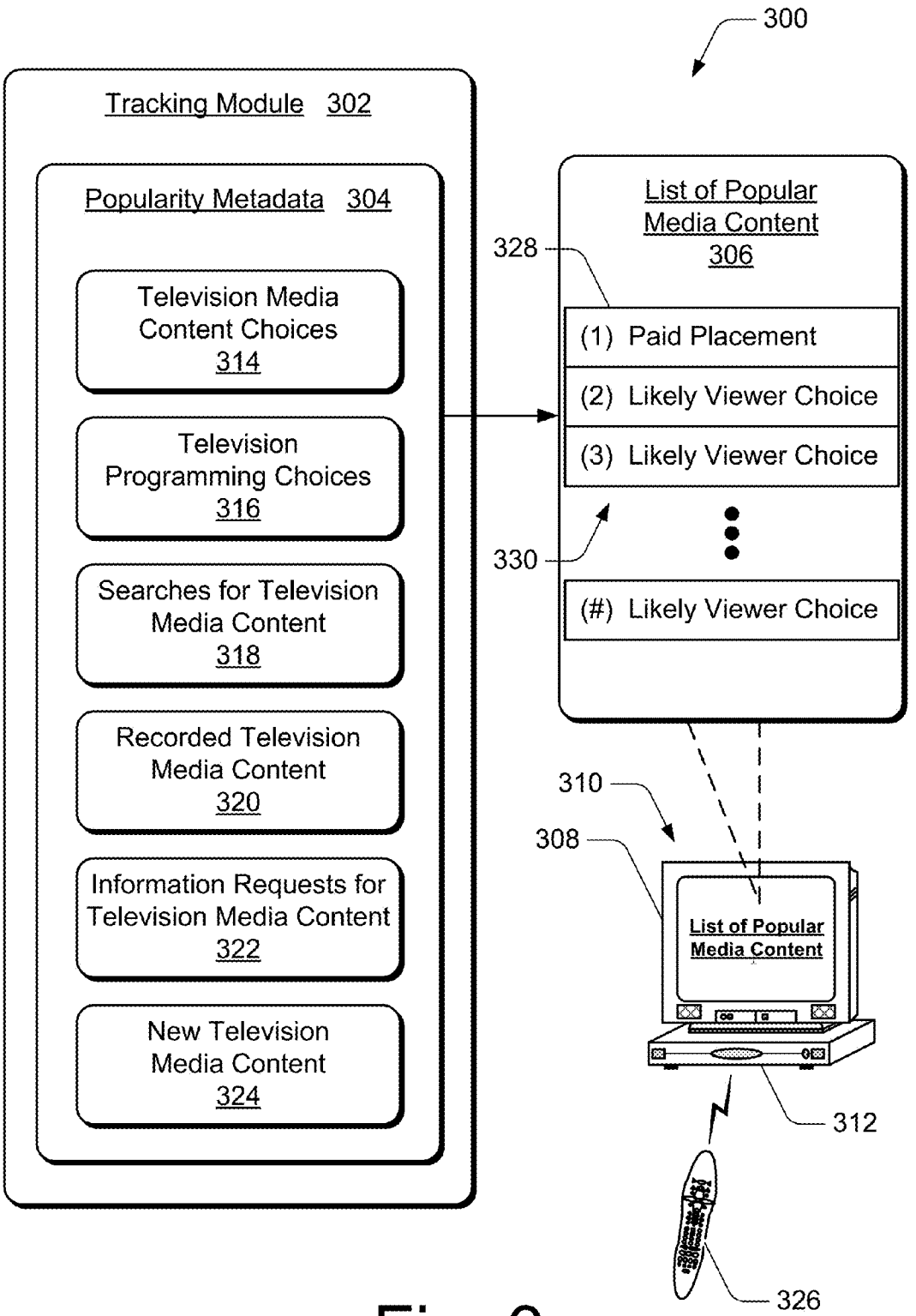

300
Tracking Module 302
Popularity Metadata 304
Television Media Content Choices 314
Television Programming Choices 316
Searches for Television Media Content 318
Recorded Television Media Content 320
Information Requests for Television Media Content 322
New Television Media Content 324
List of Popular Media Content 306
328
(1) Paid Placement
(2) Likely Viewer Choice
(3) Likely Viewer Choice
330
(#) Likely Viewer Choice
310
308
List of Popular Media Content
312
326

Fig. 3

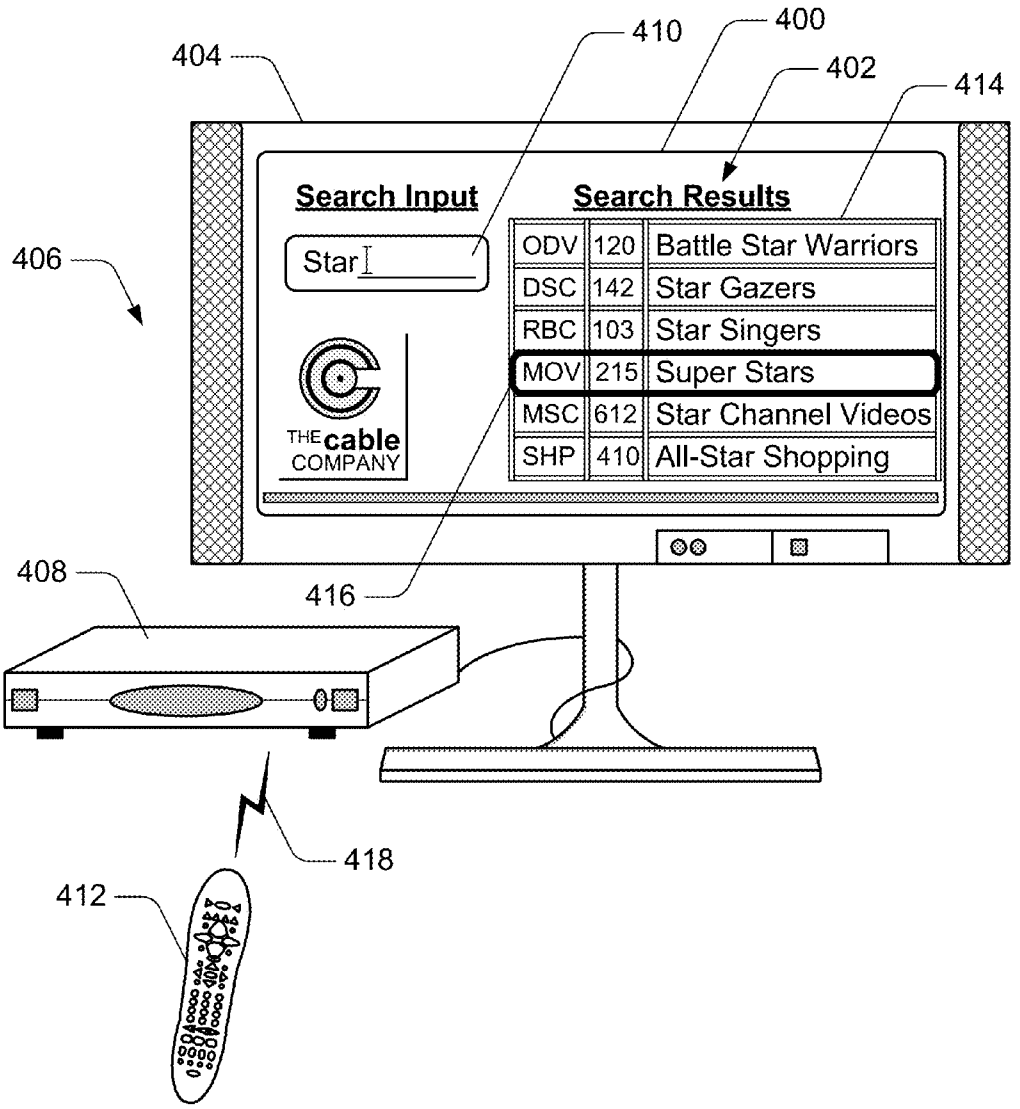

404
410
400
402
414
406
Search Input
Search Results
Star
ODV 120 Battle Star Warriors
DSC 142 Star Gazers
RBC 103 Star Singers
MOV 215 Super Stars
MSC 612 Star Channel Videos
SHP 410 All-Star Shopping
THE cable COMPANY
408
416
418
412

Fig. 4

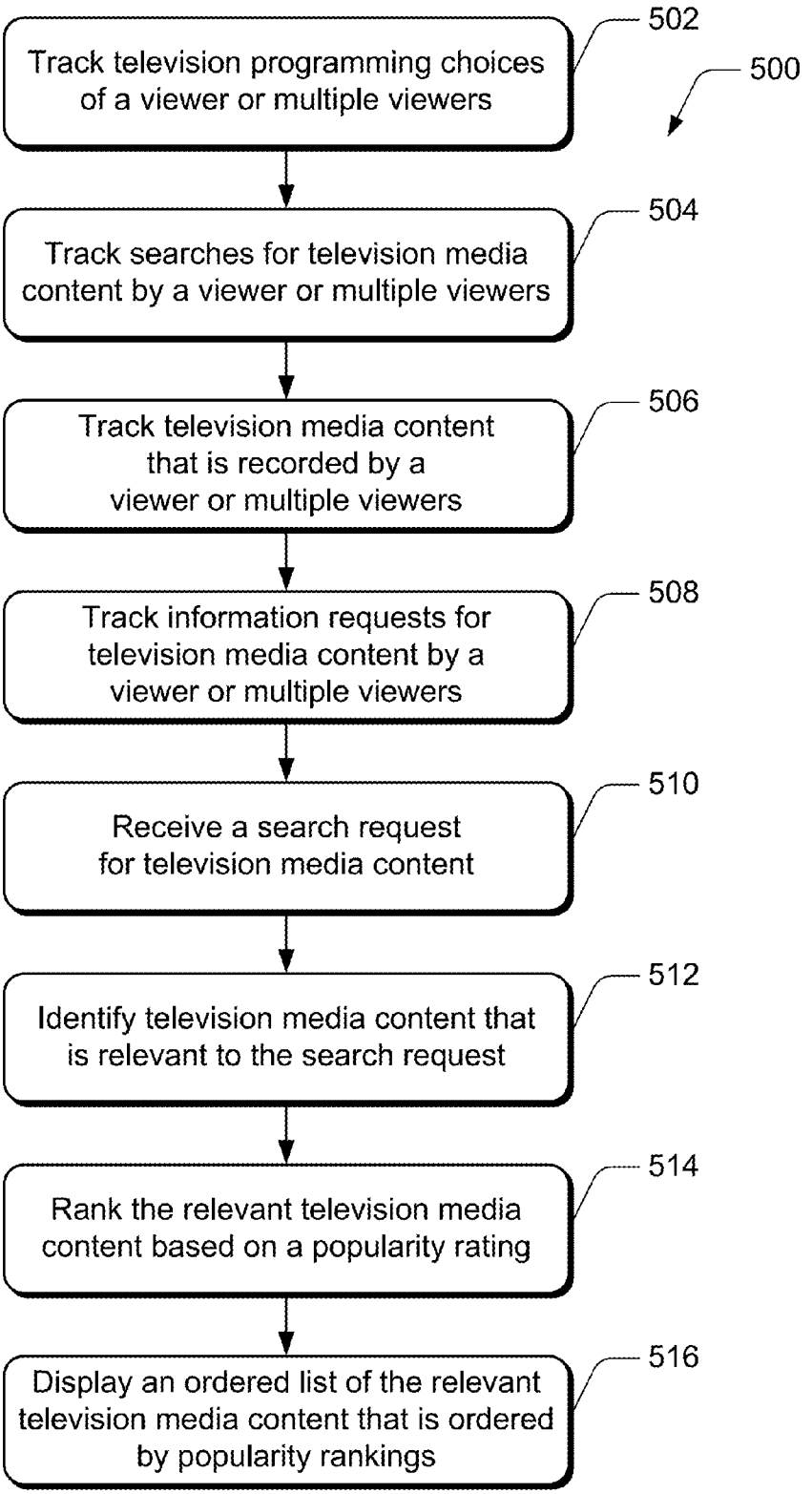

Track television programming choices of a viewer or multiple viewers
502
500
Track searches for television media content by a viewer or multiple viewers
504
Track television media content that is recorded by a viewer or multiple viewers
506
Track information requests for television media content by a viewer or multiple viewers
508
Receive a search request for television media content
510
Identify television media content that is relevant to the search request
512
Rank the relevant television media content based on a popularity rating
514
Display an ordered list of the relevant television media content that is ordered by popularity rankings
516

Fig. 5

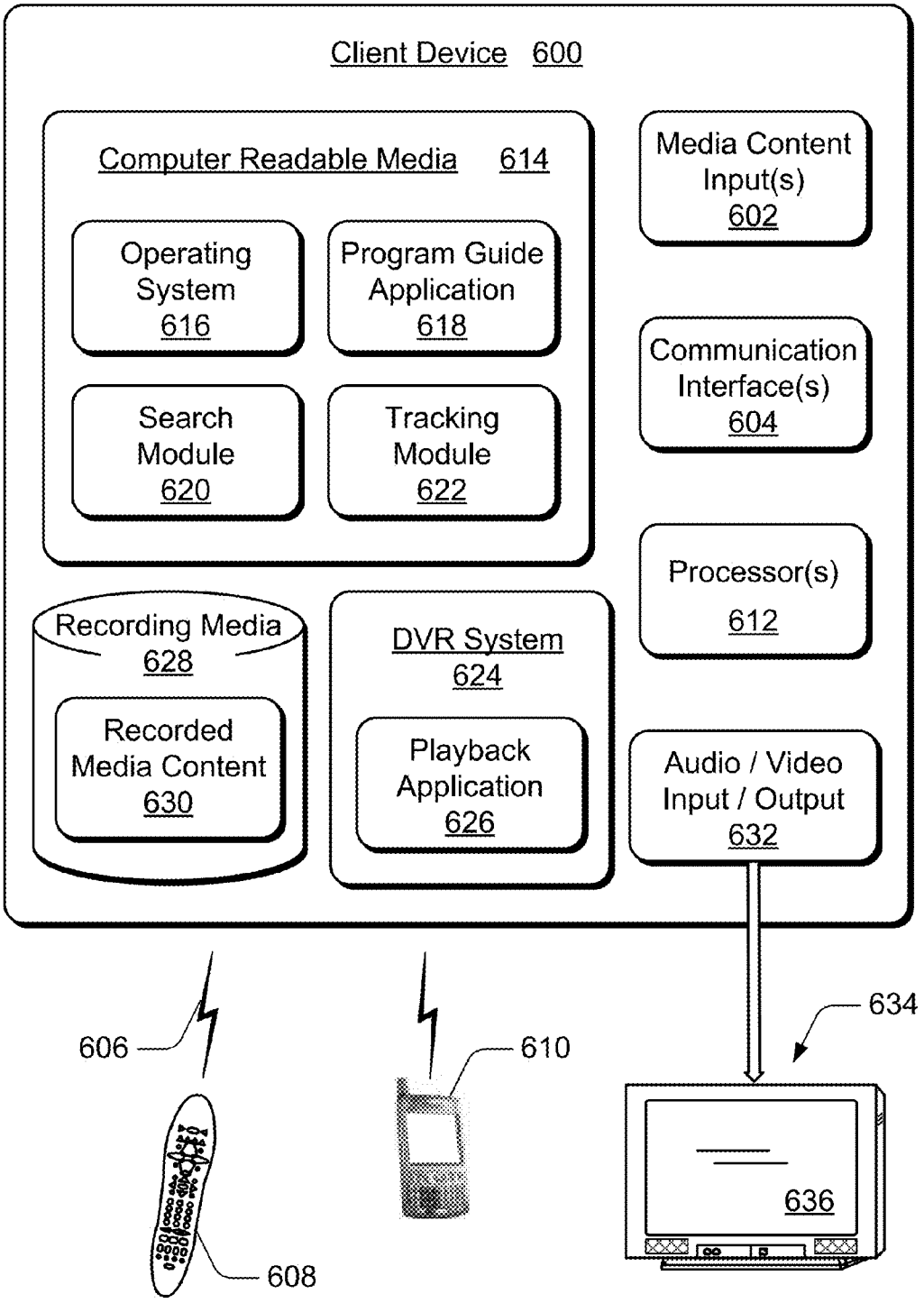

Client Device 600
Computer Readable Media 614
Operating System 616
Program Guide Application 618
Search Module 620
Tracking Module 622
Media Content Input(s) 602
Communication Interface(s) 604
Processor(s) 612
Recording Media 628
Recorded Media Content 630
DVR System 624
Playback Application 626
Audio / Video Input / Output 632
606
610
634
636
608

Fig. 6

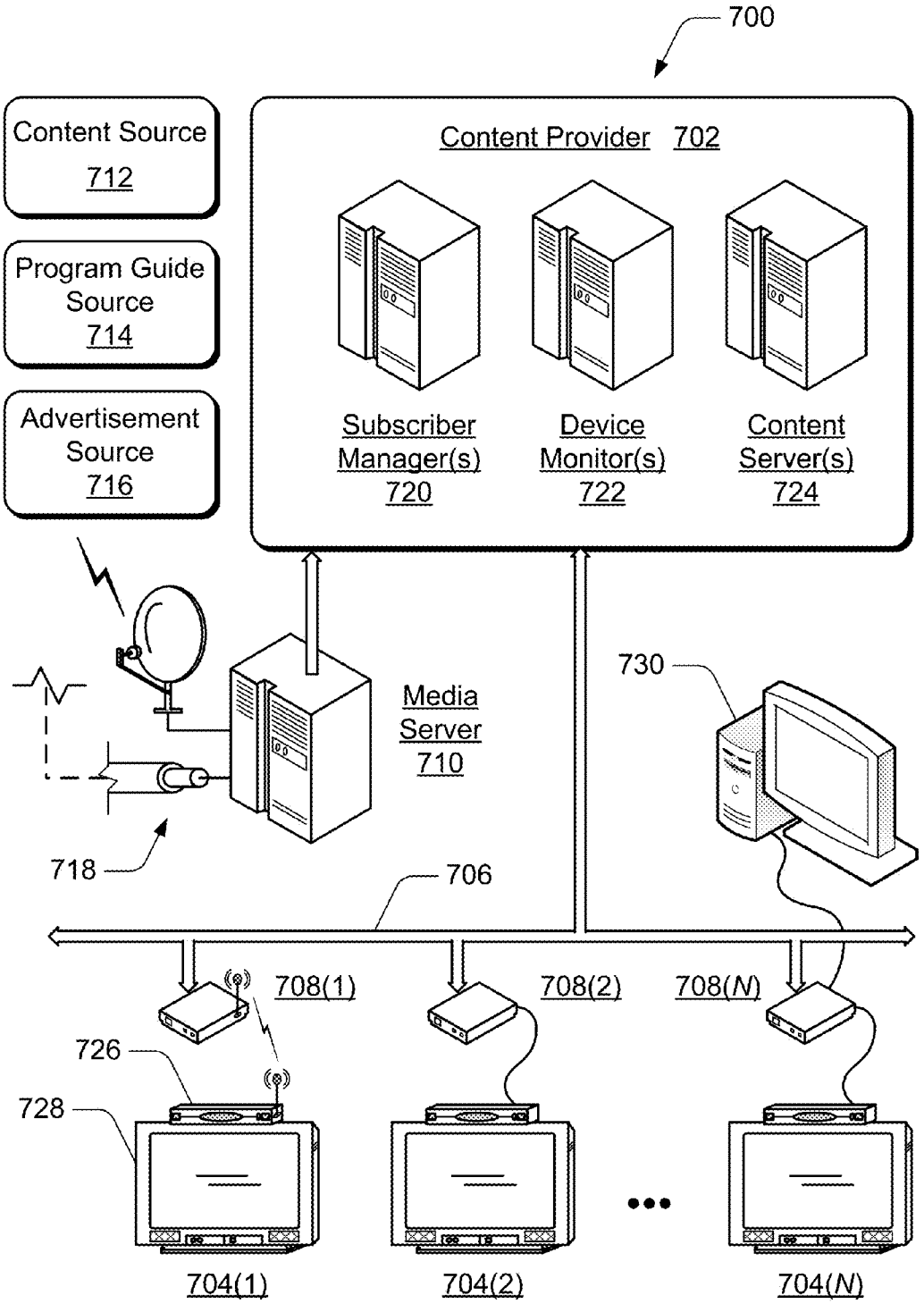

700
Content Source
712
Program Guide
Source
714
Advertisement
Source
716
Content Provider 702
Subscriber
Manager(s)
720
Device
Monitor(s)
722
Content
Server(s)
724
Media
Server
710
730
718
706
708(1)
708(2)
708(N)
726
728
704(1)
704(2)
704(N)

Fig. 7

MEDIA CONTENT SEARCH RESULTS RANKED BY POPULARITY

RELATED APPLICATIONS

This application is a continuation of and claims priority to U.S. patent application Ser. No. 12/846,442, filed Jul. 29, 2010, entitled "Media Content Search Results Ranked by Popularity", which is a continuation of and claims priority to U.S. patent application Ser. No. 11/716,236, filed Mar. 9, 2007, entitled "Media Content Search Results Ranked by Popularity", the disclosures of which are incorporated herein by reference in their entirety.

BACKGROUND

As the variety of television programming and media content sources continues to increase, viewers may want to locate television media content and programming choices that may be of interest to them. In addition to scheduled television program broadcasts, television viewing options also include on-demand choices which enable a viewer to search for and request media content for viewing when convenient rather than at a scheduled broadcast time.

A viewer can initiate a search for a list of television programming choices in a program guide (also commonly referred to as an electronic program guide or "EPG"). A search is typically based on text-string matching, and an alphabetical list of programs and/or movies is filtered and returned in response to the search request. Another type of search for television programming choices is a field-based search, such as a search for "new movies" or "sports". Text-string matching is a fairly limited form of searching, in that a viewer's results will be limited to a set of programs that happen to have the search string in a particular field, and therefore the search results are dependent on what the metadata creators add to the field descriptions. This leads to the viewer obtaining results that either do not have the desired program or bury the desired program in a long list of results because many programs have the same text-string. In addition, if a viewer misspells a search term, the search system can return unwanted results or even no results at all.

Unwanted, too many, or even no search results can lead to viewer dissatisfaction when wanting to locate television programming that may be of interest to the viewer. In addition, a search initiated via a program guide may be cumbersome for a viewer who enters the search term(s) with a remote control device. Further, a slowly delivered search response from a search system of a content provider can increase the frustration of repeated searching for the viewer.

SUMMARY

This summary is provided to introduce simplified concepts of media content search results ranked by popularity. The simplified concepts are further described below in the Detailed Description. This summary is not intended to identify essential features of the claimed subject matter, nor is it intended for use in determining the scope of the claimed subject matter.

In embodiments, a search request for television media content can be initiated by a viewer, and the television media content that is relevant to the search request can be identified. The relevant television media content can then be ranked based on a popularity rating and the relevant television media content can be displayed in an ordered list that is ordered by popularity rankings.

In other embodiments, a television client device can receive a search request for television media content, and a search module can identify the television media content that is relevant to the search request. A tracking module can track one or more searches for the television media content, information requests, programming choices, recordings, and/or new television media content to develop a popularity rating. The tracking module can then rank the relevant television media content based on the popularity rating to determine popular media content. A list of the popular media content can be displayed to include likely viewer choices. The tracking module can be implemented as a component of the television client device, as a component of a content provider that provides the television media content to the television client device, or as a component of both.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of media content search results ranked by popularity are described with reference to the following drawings. The same numbers are used throughout the drawings to reference like features and components:

FIG. **1** illustrates an example system in which embodiments of media content search results ranked by popularity can be implemented.

FIG. **2** illustrates another example system in which embodiments of media content search results ranked by popularity can be implemented.

FIG. **3** illustrates an example tracking module having popularity metadata from which a list of popular media content can be generated in embodiments of media content search results ranked by popularity.

FIG. **4** illustrates an example user interface that displays an ordered list of search results for television media content that are ordered by popularity rankings in embodiments of media content search results ranked by popularity.

FIG. **5** illustrates example method(s) for media content search results ranked by popularity in accordance with one or more embodiments.

FIG. **6** illustrates various components of an example client device which can implement embodiments of media content search results ranked by popularity.

FIG. **7** illustrates various devices and components in an example entertainment and information system in which embodiments of media content search results ranked by popularity can be implemented.

DETAILED DESCRIPTION

One or more embodiments of media content search results ranked by popularity enables a viewer to enter search term(s) to initiate a search request for television media content, and to receive a list of media content whose identification and ordering is informed by a popularity measure, such as a popularity rating. The list of media content can be organized based on the popularity of the television media content as determined from tracked television media content. The television media content, such as programs, movies, music, on-demand media content, network-based applications, and the like, can be tracked to identify and rank the media content that a viewer or viewers would likely search and request for viewing. The popularity of the tracked media content can be estimated to provide a viewer with likely programming choices for viewing, rather than simply returning an alphabetical list of television viewing selections when a viewer initiates a search request.

While features and concepts of the described systems and methods for media content search results ranked by popularity can be implemented in any number of different environments, computing systems, entertainment systems, and/or other various configurations, embodiments of media content search results ranked by popularity are described in the context of the following example systems and environments.

FIG. **1** illustrates an example system **100** in which various embodiments of media content search results ranked by popularity can be implemented. In this example, system **100** includes a television client device **102**, a display device **104**, content provider(s) **106**, and input devices **108**, such as a remote control device and/or a computer keyboard. The display device **104** can be implemented as any type of television, LCD, or similar television-based display system that renders audio, video, and/or image data. The client device **102** and display device **104** together are just one example of a television client system, examples of which are described with reference to the example entertainment and information system shown in FIG. **7**.

Client device **102** can be implemented as any one or combination of a television set-top box, a digital video recorder (DVR) and playback system, an appliance device, a gaming console, and/or as any other type of television client device or computing-based device that may be implemented in a television entertainment and information system. In this example, client device **102** includes one or more processor(s) **110**, media content **112** (e.g., received media content or media content that is being received), and recording media **114** that maintains recorded media content **116**.

Client device **102** also includes a tracking module **118**, a search module **120**, and a program guide application **122**, all of which can be implemented as computer-executable instructions and executed by the processor(s) **110** to implement embodiments of media content search results ranked by popularity. Additionally, client device **102** can be implemented with any number and combination of differing components as further described with reference to the example client device shown in FIG. **6**.

Although the tracking module **118**, search module **120**, and program guide application **122** are each illustrated and described as single applications, each can be implemented as several component applications or modules distributed to perform one or more functions of media content search results ranked by popularity. Further, although the tracking module **118**, search module **120**, and program guide application **122** are illustrated and described as separate applications, the tracking module **118**, search module **120**, and/or program guide application **122** can be implemented together as a single application in the client device **102** to implement embodiments of media content search results ranked by popularity.

The media content **112** and/or the recorded media content **116** can include television programs (or programming), which may be any form of programs, commercials, music, movies, and video on-demand media content. Other media content can include interactive games, network-based applications, music streamed from a computing device to the client device **102**, as well as any other audio, video, and/or image content received from any type of media content source.

The recording media **114** along with a playback application can be implemented as a DVR system to record and maintain the recorded media content **116**. The television client device **102** can be configured for communication with the content provider(s) **106** via a communication network **124**, which in this example can include an IP-based network as described with reference to the communication network(s) shown in FIGS. **2** and **6**. Client device **102** receives the media content **112** and/or the recorded media content **116** from content server(s) of the content provider(s) **106** via the communication network **124**. The communication network **124** can be implemented using any type of network topology and/or communication protocol, and can be represented or otherwise implemented as a combination of two or more networks.

In one or more embodiments, the tracking module **118** can be implemented to track various aspects of television programming and recordings at the client device **102**. For example, the tracking module **118** can track television programming choices selected by a viewer who interacts with the client device **102**; searches for television media content initiated by a viewer; the recorded media content **116**; listings for new television media content; and/or any other type of requests for television media content initiated by a viewer at client device **102**.

The tracking module **118** can include popularity metadata **126** from which a popularity rating for television media content can be determined or generated. The popularity of television media content can be determined according to a popularity factor, ranking, and/or index when tracking various aspects of television programming and recordings at client device **102**. The popularity metadata **126** can include data and real-time tracking information corresponding to viewer programming choices (e.g., specific shows or a series of programs that a viewer selects to watch), search requests for media content, recordings, information requests, new television media content, and the like.

Further, the popularity metadata **126** can include the data and tracking information corresponding to one or multiple viewers. For example, many search requests from different viewers can be encompassed in the metadata associated with a particular program. The tracking module **118** can then determine the popularity of the particular program based on how often the media content is selected for viewing, recording, information requests, and/or any other type of viewer interaction. The tracking module **118** can also be implemented for collaborative filtering to identify a series of programs as popular media content for a viewer at the client device **102**.

In addition to the traditional metadata associated with television media content, such as a title, the actors, a genre, and a description of the media content, the popularity metadata **126** can include the tracking data as well as additional information. For example, the popularity metadata **126** can include ratings from ratings providers, such as NIELSEN and/or ARBITRON data for a previous week, month, or other duration to approximate how many viewers watched a particular program.

The popularity metadata **126** can also include projected popularity rankings for new and/or upcoming television media content that will likely be requested often by many viewers. For example, the ranking of programming associated with the SUPER BOWL can be increased in advance of when the SUPER BOWL is played. In addition, the popularity metadata **126** can include any other popularity metrics upon which to base a popularity factor, ranking, and/or index to determine popular media content.

In one or more embodiments, client device **102** includes the program guide application **122** that can be implemented to process program guide data from which a program guide can be rendered and/or displayed for viewing on display device **104**. A program guide may also be commonly referred to as an electronic program guide or an "EPG". In this example, a program guide search interface **128** is displayed on display device **104** and includes a search input field **130** via which a

viewer can input search term(s) to initiate a search request for television media content. A viewer can input the search term (s) to initiate the search request utilizing an input device **108**, such as the remote control.

In an embodiment, the search module **120** can receive a search request for television media content when initiated by a viewer, and identify the television media content that is relevant to the search request. The tracking module **118** can then rank the relevant television media content based on a popularity rating and the relevant television media content can be displayed in an ordered list that is ordered by popularity rankings. The relevant television media content can include one or more likely viewer choices of popular media content displayed in the ordered list.

In an embodiment, the search results for television media content can include relevant media content based on a partial match to a search term of a viewer-initiated search request. For example, a viewer may enter only "Super" as shown on the display device **104** in the search input field **130**. The search module **120** may identify many different media content choices having a partial match to the search term "Super". From the identified media content that is relevant to the search request, the tracking module **118** can determine that the viewer is likely requesting television media content associated with the SUPER BOWL if the search request is initiated at a time when the SUPER BOWL is an often requested and/or anticipated event. For example, the popularity metadata **126** associated with the SUPER BOWL will reflect many search, viewing, and/or recording requests from multiple viewers. The tracking module **118** can then rank the relevant television media content based on a popularity rating generated from the popularity metadata **126**.

Once a viewer learns that a specific and/or complete text match is not necessary when initiating a search request to find television media content, the viewer can reduce the inputs needed via the search input field **130**. Reducing the number of search inputs also makes searching easier for the viewer, particularly when utilizing the remote control input device **108** which can be cumbersome to enter the search characters.

In another embodiment, the search module **120** can be implemented to identify media content that is relevant to a search request from the popularity metadata **126** based on an incorrect search term of the search request. For example, a viewer may want to watch a particular movie, such as a movie entitled "Irretrievably Broken", but has forgotten the title of the movie. The viewer may inadvertently enter a search request of "Retrievable". If the entered text string "Retrievable" were compared in a text-based search to the "title" metadata fields for television media content, a match to the sought after movie will not be located. However, the search module **120** can compare the entered text string "Retrievable" to the popularity metadata **126**. A popularity result of the movie "Irretrievably Broken" which most closely matches the viewer request will be returned when the popularity metadata **126** associated with the movie reflects multiple search, viewing, and/or recording requests. The likely viewer choice can then be displayed in a list of popular media content from which the viewer can select to receive the requested movie for viewing.

In another example, the popularity of media content can optionally be customized for a particular viewer in the popularity metadata **126**. For example, a viewer may enter a search request for a particular word, such as "Star", in the search input field **130** on display device **104**. The search module **120** may identify the programs "Star Gazers" and "Star Singers" as relevant media content to the search request. The tracking module **118** may then rank "Star Gazers" as the most likely relevant media content for the viewer because a history of this viewer's television programming choices in the popularity metadata **126** indicates that the viewer watches the program "Star Gazers", even though the program "Star Singers" may currently be a more popular program among multiple viewers.

In another example, one friend may call another to say, "watch the reality show that is on right now", and the called viewer can then enter a search request for "Reality" in the search input field **130**. The search module **120** can receive the search request for "Reality" and compare the search term entry to the popularity metadata **126** and the "genre" metadata fields to locate the likely television reality program. The reality show can be identified by the tracking module **118** as the likely viewer choice because the program is currently being broadcast and has been selected for viewing by many other viewers.

In an embodiment, the tracking module **118** can also rank television media content that is identified as being relevant to a search request based on a projected popularity of new television media content. When new or upcoming television media content is scheduled to be available, the media content can be weighted to establish a popularity-basis for the new media content.

In a projected popularity ranking scenario, or optionally a manual ranking scenario, a network operator at a content provider **106** may assume that an upcoming event or program will be popular and often requested for viewing and/or recording. However, the upcoming event or program will not have any associated tracking and/or popularity metadata to indicate a popularity history of the program before the program is available for viewing. Projected rankings may therefore be accomplished by manual assignment of popularity values to the upcoming media assets to match the operator's prediction of the popularity of the media. Alternatively, popularity values can be derived from historical data (e.g. for an annual show, popularity ratings for the program historically), or popularity of the content in other media forms (e.g. for a new Pay-Per-View movie, the popularity ranking can be derived from the movie's success in the theatres).

The tracking module **118** can then rank the program having the weighted popularity as a likely selectable viewing option for a viewer. For example, if a new movie that has been popular in the theatres is about to be released for video on-demand viewing, a network operator can project the popularity of the movie by weighting it to influence the popularity of the media content.

After the relevant television media content is identified by the search module **120**, the tracking module **118** can rank the relevant television media content based on a popularity rating to determine popular media content in one or more embodiments. A list of the popular media content, or just the higher-ranking popular media content, can then be displayed on the display device **104** in response to a viewer-initiated search request. An example of a list of popular media content is further described with reference to the example shown in FIG. **3**. The media content can be ranked according to viewer(s) programming choices, viewer(s) recording choices, information requests that are initiated or spawned from initial search results, and/or by any other metric by which the media content can be ranked.

In alternate embodiments of media content search results ranked by popularity, a content provider **106** can be implemented to include a tracking module. A tracking module at a content provider can also update popularity metadata to track the various aspects of television programming and recording selections of multiple viewers at multiple television client

devices. These embodiments are further described with reference to the example system shown in FIG. **2**. Alternatively, both content provider(s) and television client devices can include an implementation of tracking modules to track the television programming and recording selections together, or optionally independently.

FIG. **2** illustrates another example system **200** in which various embodiments of media content search results ranked by popularity can be implemented. The system **200** includes a content provider **202** that communicates media content **204** to any number "N" of various television client systems **206**(**1**-N) via a communication network **208**. An example of a communication network is described with reference to communication network **124**, and examples of client devices in television client systems are described with reference to television client device **102** as shown in FIG. **1**.

Each of the client systems **206**(**1**-N) include a television client device and a respective display device, such as any type of television, monitor, LCD, or similar television-based display system that renders audio, video, and/or image data. Any of the client devices of the client systems **206**(**1**-N) can be implemented as any one or combination of a television client device, a gaming system, or as any other computing-based device, such as a desktop computer, a portable computer, a television set-top box, a digital video recorder (DVR), an appliance device, a gaming console, and/or as any other type of computing-based client device. A television client device may also be associated with a user (i.e., a person) and/or an entity that operates a client device such that a television client device describes logical clients that include users, software, and/or devices.

Any of the television client devices of the respective client systems **206**(**1**-N) can be implemented with one or more processors, a communication module, memory components, and a media content rendering system. Additionally, each of the television client devices can be configured for communication with any number of the different content providers to receive any type of media content from the content provider(s) via the communication network **208**. Further, any of the television client devices can be implemented with any number and combination of differing components as further described with reference to the example client device shown in FIG. **6**.

In this example, content provider **202** includes a tracking module **210** having popularity metadata **212**. In one or more embodiments, tracking module **210** can be implemented to track various aspects of television programming and recordings at the client systems **206**(**1**-N). For example, the tracking module **210** can track television programming choices selected by multiple viewers that interact with the client devices; searches for television media content initiated by the multiple viewers; television media content recorded by the multiple viewers; listings for new television media content; and/or any other type of requests for television media content initiated by the multiple viewers at the various client systems **206**(**1**-N).

The tracking module **210** can include popularity metadata **212** from which the more popular media content can be determined. The popularity of television media content can be determined according to a popularity rating, factor, ranking, and/or index when tracking the various aspects of television programming and recordings at the client systems **206**(**1**-N). The tracking module **210** can determine or develop a popularity rating for particular media content based on how often the media content is selected for viewing, recording, information requests, and/or any other type of viewer interaction.

The popularity metadata **212** can include data and the real-time tracking information corresponding to viewer programming choices, search requests for media content, recordings, information requests, new television media content, and the like. In an embodiment, the real-time tracking information can be obtained via the communication network **208** when implemented as a network that includes a back-channel or other two-way communication link **214** between the content provider **202** and the television client systems **206**(**1**-N). In an IPTV system, such as shown in FIG. **7**, an IP-based network provides two-way communication via which the tracking module **210** receives real-time tracking information for viewer-initiated media content interactions at the client systems **206**(**1**-N).

Although data streams of media content are not shown specifically, the arrowed communication links **214** and the communication network **208** illustrate various data communication links that include data streams of media content. Additionally, it is contemplated that any one or more of the arrowed communication links **208**, **214** can facilitate two-way data communication, such as from the content provider **202** to television client system **206**(**1**) and vice-versa.

The popularity metadata **212** can also include additional information, such as ratings from ratings providers **216** to approximate how many viewers watched a particular program. The popularity metadata **212** can also include projected popularity rankings for new and/or upcoming television media content that will likely be requested often by many viewers.

The tracking module **210** can receive a search request for television media content via the communication network **208** when the search request is initiated by a viewer at a television client system **206**(**1**-N). In one or more embodiments, the tracking module **210** can be implemented to rank television media content that is relevant to a search request based on the popularity rating as determined from the popularity metadata **212**. A list of popular media content, or just the higher-ranking popular media content, can then be displayed at a client system **206**(**1**-N) in response to a viewer-initiated search request.

FIG. **3** illustrates an example **300** of a tracking module **302** having popularity metadata **304** from which a popularity rating can be determined. Television media content that is relevant to a search request can be ranked by the tracking module **302** based on the popularity rating. A list of popular media content **306** can be generated for display on a display device **308** of a television client system **310** (to include a television client device **312**). Features and embodiments of the tracking module **302** are described with reference to tracking module **118** implemented at client device **102** as shown in FIG. **1**, and/or with reference to tracking module **210** implemented at content provider **202** as shown in FIG. **2**.

The popularity metadata **304** is one example of the popularity metadata included with the tracking modules and described with reference to FIGS. **1** and **2**. In one or more embodiments, the tracking module **302** can be implemented to track various television media content programming, recording, and information selections by a viewer or a group of viewers. The tracking module **302** then maintains information pertaining to the tracked television programming choices, recordings, and information selections as the popularity metadata **304**.

In this example, the popularity metadata **304** includes data and tracking information about television media content choices **314**; television programming choices **316**; searches for television media content **318**; recorded television media content **320**; information requests for television media con-

tent **322**; and/or new television media content **324**. The tracking module **302** can rank television media content that is relevant to a search request based on a popularity rating to determine popular media content. The list of popular media content **306** can then be generated to include all of the popular media content, or just the higher-ranking popular media content. The list of popular media content **306** can be displayed at the client system **310** in response to a viewer-initiated search request for media content. A viewer at client device **312** can then select a programming choice from the list **306** with a remote control input device **326**.

In one or more embodiments, the list of popular media content **306** can be displayed to optionally include paid placement of particular media content at a position in the list that is more prominent than popular media content without paid placement. For example, a business method may allow a content provider to pay for the placement of a new video on-demand movie at a prominent position in the list for likely viewer selection. In an example, the list of popular media content **306** can be displayed to include paid placement of particular media content at a first position **328** in the list. Alternatively, the list of popular media content **306** can be displayed to include a likely viewer choice at the first position **328** in the list.

In this example, the list of popular media content **306** includes paid placement of media content at the first position **328** in the list, and then includes likely viewer choices at the subsequent positions **330** in the list. For example, a likely viewer choice based on the television programming choices **316** of the viewer (e.g., a user history popularity) can be displayed at a second position in the list. Further, at least an additional likely viewer choice based on the television programming choices of multiple viewers (e.g., a general history popularity) can be displayed at a third position in the list.

FIG. **4** illustrates an example of a user interface **400** that displays an ordered list **402** of search results for television media content that are ordered by popularity rankings. The ordered list **402** of search results is shown on a display device **404** of a television client system **406** that includes a television client device **408**. The television media content shown ranked in the list **402** can be displayed in response to a viewer-initiated search request for television media content. For example, user interface **400** includes a search input field **410** via which a viewer can input search term(s) to initiate a search request for television media content. A viewer can input the search term(s) to initiate the search request utilizing an input device **412**, such as a remote control.

In this example, a viewer may enter a search request for a particular word, such as "Star", in the search input field **410** on display device **404**. A search module of client device **408** may then identify any number of various programs, movies, and/or other media content corresponding to the search term "Star". A tracking module of client device **408** can then rank the various programs, movies, and/or other media content (i.e. the relevant television media content) based on a popularity rating. The ordered list **402** of relevant television media content can then be displayed from which a viewer can select one of the media content for viewing with the remote control input device **412**.

The ordered list **402** of search results for the television media content is shown on display device **404** in a viewer-navigable grid **414** of a program guide that enables a viewer to navigate the grid and select media content for viewing. In addition to the list of television media content, the ordered list **402** can include any type of associated numeric and/or channel designators as additional information about particular television media content.

The viewer-navigable grid **414** can include a selectable control **416** shown implemented as an on-screen focus that can be positioned to identify particular television media content and, when selected, initiate receiving the program, movie, or other media content for viewing. A viewer can move the selectable control **416** within the grid **414** and select the various listed media content by manipulating the remote control input device **412** via which the viewer can input control commands **418**.

In one or more embodiments, the ordered list **402** can be displayed to optionally include paid placement of particular media content at a position in the list that is more prominent than media content without paid placement. For example, the new video on-demand movie "Battle Star Warriors" is positioned at a prominent position (e.g., at the top of the list) for likely viewer selection. Alternatively, the ordered list **402** of ranked television media content can be displayed to include a likely viewer choice at the first position in the list.

Generally, any of the functions, methods, and modules described herein can be implemented using hardware, software, firmware (e.g., fixed logic circuitry), manual processing, or any combination thereof. A software implementation of a function, method, or module represents program code that performs specified tasks when executed on a computing-based processor. Example method **500** described with reference to FIG. **5** may be described in the general context of computer-executable instructions. Generally, computer-executable instructions can include applications, routines, programs, objects, components, data structures, procedures, modules, functions, and the like that perform particular functions or implement particular abstract data types. The method may also be practiced in a distributed computing environment where functions are performed by remote processing devices that are linked through a communications network. In a distributed computing environment, computer-executable instructions may be located in both local and remote computer storage media, including memory storage devices. Further, the features described herein are platform-independent and the techniques may be implemented on a variety of computing platforms having a variety of processors.

FIG. **5** illustrates example method(s) **500** of media content search results ranked by popularity. The order in which the method is described is not intended to be construed as a limitation, and any number of the described method blocks can be combined in any order to implement the method, or an alternate method.

At block **502**, television programming choices of a viewer or multiple viewers are tracked. For example, tracking module **118** (FIG. **1**) tracks the television programming choices of a viewer or multiple viewers at television client device **102**. The tracking module **118** maintains the tracking information as popularity metadata **126**. Alternatively, or in addition, tracking module **210** (FIG. **2**) at content provider **202** tracks television programming choices of multiple viewers at television client systems **206**(**1**-N). The tracking module **210** maintains the tracking information as popularity metadata **212**. Further, tracking module **302** (FIG. **3**) can track the television programming choices **316** of one or more viewers at various television client devices. In an embodiment, real-time tracking information can be received from multiple viewers via a two-way communication network, such as an IP-based communication network that facilitates a two-way communication link between content provider(s) and television client systems in an IPTV system.

At block **504**, searches for television media content by a viewer or multiple viewers are tracked. For example, tracking module **118** tracks searches for television media content by a

viewer or multiple viewers at client device **102**. Similarly, tracking module **210** tracks searches for television media content by multiple viewers at client systems **206**(**1**-N), and/or tracking module **302** tracks searches for television media content **318**.

At block **506**, television media content that is recorded by a viewer or multiple viewers are tracked. For example, tracking module **118** tracks television media content that is recorded by a viewer or multiple viewers at client device **102**. Similarly, tracking module **210** tracks television media content that is recorded by multiple viewers at client systems **206**(**1**-N), and/or tracking module **302** tracks recorded television media content **320**.

At block **508**, information requests for television media content by a viewer or multiple viewers are tracked. For example, tracking module **118** tracks information requests for or about television media content by a viewer or multiple viewers at client device **102**. Similarly, tracking module **210** tracks information requests for television media content by multiple viewers at client systems **206**(**1**-N), and/or tracking module **302** tracks information requests for television media content **322**.

At block **510**, a search request for television media content is received. For example, search module **120** receives a search request for television media content initiated by a viewer at client device **102**. Similarly, tracking module **210** can receive search requests for television media content that are initiated by multiple viewers at client systems **206**(**1**-N) (via communication network **208**).

At block **512**, television media content that is relevant to the search request is identified. For example, search module **120** identifies television media content that is relevant to a search request initiated by a viewer at client device **102**. The search results for television media content can include relevant media content based on a partial match to a search term of a viewer-initiated search request. Additionally, the search module **120** can identify media content that is relevant to a search request from the popularity metadata **126** based on an incorrect search term of the search request.

At block **514**, the relevant television media content is ranked based on a popularity rating. For example, tracking module **118** ranks the relevant television media content at client device **102** based on a popularity rating to determine popular media content. The popularity rating is determined from the popularity metadata **126** according to viewer programming choices, viewer recording choices, information requests that are initiated or spawned from initial search results, and/or by any other metric by which the relevant television media content can be ranked. Similarly, tracking module **210** ranks the relevant television media content for a viewer or multiple viewers at any of the client systems **206**(**1**-N).

At block **516**, a list of the relevant television media content is displayed in an ordered list that is ordered by popularity rankings. For example, the ordered list **402** of search results for television media content can be displayed from which a viewer can select one of the media content for viewing. The ordered list **402** is displayed to include the relevant television media content that is ordered by popularity rankings.

In another example, the list of popular media content **306** can be generated for display on display device **308** of the television client system **310** and a viewer can select a programming choice with the remote control input device **326**. The list of popular media content **306** can be displayed to include all of the popular media content, or just the higher-ranking popular media content. The list of popular media content **306** can also be displayed to include paid placement of particular media content at a first position **328** in the list; a likely viewer choice based on television programming choices of the viewer at a second position in the list; and at least an additional likely viewer choice based on television programming choices of multiple viewers at a third position in the list.

FIG. **6** illustrates various components of an example client device **600** that can be implemented as any form of a computing, electronic, or television client device to implement embodiments of media content search results ranked by popularity. For example, client device **600** can be implemented as client device **102** shown in FIG. **1**, and/or as any of the client devices of the client systems **206**(**1**-N) shown in FIG. **2**. In various embodiments, client device **600** can be implemented as any one or combination of a television client device, a gaming system, or as any other computing-based device, such as a desktop computer, a portable computer, a television set-top box, a digital video recorder (DVR), an appliance device, a gaming console, and/or as any other type of computing-based client device.

Client device **600** includes one or more media content inputs **602** that may include Internet Protocol (IP) inputs over which streams of media content are received via an IP-based network. Device **600** further includes communication interface(s) **604** that can be implemented as any one or more of a serial and/or parallel interface, a wireless interface, any type of network interface, a modem, and as any other type of communication interface. A wireless interface enables client device **600** to receive control input commands **606** and other information from an input device, such as from remote control device **608**, a portable computing-based device (such as a cellular phone) **610**, or from another infrared (IR), 802.11, Bluetooth, or similar RF input device.

A network interface provides a connection between client device **600** and a communication network by which other electronic and computing devices can communicate data with device **600**. Similarly, a serial and/or parallel interface provides for data communication directly between client device **600** and the other electronic or computing devices. A modem facilitates client device **600** communication with other electronic and computing devices via a conventional telephone line, a DSL connection, cable, and/or other type of connection.

Client device **600** also includes one or more processors **612** (e.g., any of microprocessors, controllers, and the like) which process various computer-executable instructions to control the operation of device **600**, to communicate with other electronic and computing devices, and to implement embodiments of media content search results ranked by popularity. Client device **600** can be implemented with computer-readable media **614**, such as one or more memory components, examples of which include random access memory (RAM), non-volatile memory (e.g., any one or more of a read-only memory (ROM), flash memory, EPROM, EEPROM, etc.), and a disk storage device. A disk storage device can include any type of magnetic or optical storage device, such as a hard disk drive, a recordable and/or rewriteable compact disc (CD), a DVD, a DVD+RW, and the like.

Computer-readable media **614** provides data storage mechanisms to store various information and/or data such as software applications and any other types of information and data related to operational aspects of client device **600**. For example, an operating system **616** and/or other application programs can be maintained as software applications with the computer-readable media **614** and executed on processor(s) **612** to implement embodiments of media content search results ranked by popularity.

Client device **600** can be implemented to include a program guide application **618** that is implemented to process program guide data and generate program guides for display. A program guide enables a viewer to navigate through an onscreen display and locate various media content such as broadcast programs, recorded programs, video on-demand programs and movies, interactive game selections, network-based applications, and other media content of interest to the viewer. In an embodiment, client device **600** can also be implemented to include a search module **620** and a tracking module **622** to implement embodiments of media content search results ranked by popularity. An example of search module **620** is described with reference to search module **120** shown in FIG. **1**. Examples of tracking module **622** are described with reference to tracking module **118** shown in FIG. **1**, tracking module **210** shown in FIG. **2**, and with reference to tracking module **302** shown in FIG. **3**.

Client device **600** can also include a DVR system **624** with playback application **626**, and recording media **628** to maintain recorded media content **630** that client device **600** receives and/or records. Further, client device **600** may access or receive additional recorded media content that is maintained with a remote data store (not shown), such as from a video-on-demand server, or media content that is maintained at a broadcast center or content provider that distributes the media content to subscriber sites and client devices. The playback application **626** is a video control application that can be implemented to control the playback of media content, the recorded media content **630**, and/or other video on-demand media content, music, and any other audio, video, and/or image media content which can be rendered and/or displayed for viewing.

Client device **600** also includes an audio and/or video output **632** that provides audio and/or video data to an audio rendering and/or display system **634**. The audio rendering and/or display system **634** can include any devices that process, display, and/or otherwise render audio, video, and image data. Video signals and audio signals can be communicated from device **600** to a display device **636** via an RF (radio frequency) link, S-video link, composite video link, component video link, DVI (digital video interface), analog audio connection, or other similar communication link. Alternatively, the audio rendering and/or display system **634** can be implemented as integrated components of the example client device **600**. Client device **600** along with the audio rendering and/or display system **634** is an example of a viewing system that can be implemented in a household viewing area for viewing television programs and/or receiving other television media content.

FIG. **7** illustrates an example entertainment and information system **700** in which an IP-based television environment can be implemented, and in which embodiments of media content search results ranked by popularity can be implemented. System **700** facilitates the distribution of media content, program guide data, and advertising content to multiple viewers and to multiple viewing systems. System **700** includes a content provider **702** and any number "N" of client systems **704**(**1**-N) each configured for communication via a communication network **706**. Each client system **704**(**1**-N) is an example of the client systems **206**(**1**-N) described with reference to FIG. **2**. Each of the client systems **704**(**1**-N) can receive one or more data streams of media content, program content, program guide data, advertising content, closed captions data, and the like from content server(s) of the content provider **702** via the communication network **706**.

The communication network **706** can be implemented as any one or combination of a wide area network (e.g., the Internet), a local area network (LAN), an intranet, an IP-based network, a broadcast network, a wireless network, a Digital Subscriber Line (DSL) network infrastructure, a point-to-point coupling infrastructure, or as any other media content distribution network. Additionally, communication network **706** can be implemented using any type of network topology and any network communication protocol, and can be represented or otherwise implemented as a combination of two or more networks. A digital network can include various hardwired and/or wireless links **708**(**1**-N), routers, gateways, and so on to facilitate communication between content provider **702** and the client systems **704**(**1**-N).

System **700** includes a media server **710** that receives media content from a content source **712**, program guide data from a program guide source **714**, and advertising content from an advertisement source **716**. In an embodiment, the media server **710** represents an acquisition server that receives the audio and video media content from content source **712**, an EPG server that receives the program guide data from program guide source **714**, and/or an advertising management server that receives the advertising content from the advertisement source **716**.

The content source **712**, the program guide source **714**, and the advertisement source **716** control distribution of the media content, the program guide data, and the advertising content to the media server **710** and/or to other servers. The media content, program guide data, and advertising content can be distributed via various transmission media **718**, such as satellite transmission, radio frequency transmission, cable transmission, and/or via any number of other wired or wireless transmission media. In this example, media server **710** is shown as an independent component of system **700** that communicates the program content, program guide data, and advertising content to content provider **702**. In an alternate implementation, media server **710** can be implemented as a component of content provider **702**.

Content provider **702** is representative of a headend service in a content distribution system, for example, that provides the media content, program guide data, and advertising content to multiple subscribers (e.g., the client systems **704**(**1**-N)). The content provider **702** can be implemented as a satellite operator, a network television operator, a cable operator, and the like to control distribution of media content, program and advertising content, such as movies, television programs, commercials, music, and other audio, video, and/or image content to the client systems **704**(**1**-N).

Content provider **702** includes various components to facilitate media data processing and content distribution, such as a subscriber manager **720**, a device monitor **722**, and one or more content servers **724**. The subscriber manager **720** manages subscriber data, and the device monitor **722** monitors the client systems **704**(**1**-N) (e.g., and the subscribers), and maintains monitored client state information.

Although the various managers, servers, and monitors of content provider **702** (to include the media server **710** in one embodiment) are illustrated and described as distributed, independent components of content provider **702**, any one or more of the managers, servers, and monitors can be implemented together as a multi-functional component of content provider **702**. Additionally, any one or more of the managers, servers, and monitors described with reference to system **700** can implement features and embodiments of media content search results ranked by popularity.

The client systems **704**(**1**-N) can each be implemented to include a client device **726** and a display device **728** (e.g., a television, LCD, and the like). A client device **726** of a client system **704** can be implemented in any number of embodi-

ments, such as a set-top box, a digital video recorder (DVR) and playback system, an appliance device, a gaming system, and as any other type of client device that may be implemented in an entertainment and information system. In an alternate embodiment, client system **704**(N) is implemented with a computing device **730** as well as a client device. Additionally, any of the client devices **726** of a client system **704** can implement features and embodiments of media content search results ranked by popularity as described herein.

Although embodiments of media content search results ranked by popularity have been described in language specific to features and/or methods, it is to be understood that the subject of the appended claims is not necessarily limited to the specific features or methods described. Rather, the specific features and methods are disclosed as example implementations of media content search results ranked by popularity.

The invention claimed is:

1. A method comprising:

receiving a search request for television media content;

identifying relevant television media content that is associated with at least one search term of the search request;

tracking viewer interactions of a plurality of viewers with television programming to develop a popularity rating, the viewer interactions including television programming choices of a viewer who initiates the search request; and

ranking the relevant television media content based on the popularity rating, the popularity rating based at least in part on the television programming choices of the viewer.

2. The method as recited in claim **1**, wherein the viewer interactions further includes television programming choices of the plurality of viewers, and wherein the popularity rating is further based at least in part on the television programming choices of the plurality of viewers.

3. The method as recited in claim **1**, wherein the viewer interactions further includes television programming choices of the plurality of viewers, wherein the popularity rating is based at least in part on the television programming choices of the viewer and on the television programming choices of the plurality of viewers, and wherein ranking the relevant television media content comprises assigning a higher weight to the television choices of the viewer than to the television choices of the plurality of viewers.

4. The method as recited in claim **1**, wherein the viewer interactions further includes search requests associated with the television programming, and wherein the popularity rating is further based at least in part on the search requests associated with the television programming.

5. The method as recited in claim **1**, wherein the viewer interactions further includes information requests for the television programming, and wherein the popularity rating is further based at least in part on the information requests for the television programming.

6. The method as recited in claim **1**, wherein identifying the relevant television media content comprises identifying the relevant television media content based on a partial match to the at least one search term of the search request.

7. The method as recited in claim **1**, wherein identifying the relevant television media content comprises identifying the relevant television media content when the search request includes at least one incorrect search term.

8. A non-transitory computer readable medium having instructions thereon for generating for display popular media content, the instructions comprising:

instructions for receiving a search request for television media content;

instructions for identifying relevant television media content that is relevant to the search request;

instructions for tracking viewer interactions of a plurality of viewers with the relevant television media content to develop a popularity rating; and

instructions for generating for display, in a user interface, paid placement of particular media content and an ordered list of the relevant television media content that is ordered based on the popularity rating.

9. The non-transitory computer-readable storage medium as recited in claim **8**, wherein the paid placement is displayed at a position in the user interface that is more prominent than the relevant television media content in the ordered list.

10. The non-transitory computer-readable storage medium as recited in claim **8**, wherein the paid placement of the particular media content comprises on-demand media content.

11. The non-transitory computer-readable storage medium as recited in claim **8**, wherein the instructions for generating for display the ordered list of the relevant television media content includes instructions for generating for display a likely viewer choice based on television programming choices of a viewer at a first position in the list, and at least an additional likely viewer choice based on television programming choices of multiple viewers at a second position in the list.

12. The non-transitory computer-readable storage medium as recited in claim **8**, wherein the instructions for tracking the viewer interactions of the plurality of viewers comprises instructions for tracking television programming choices of a viewer who initiates the search request, and wherein the popularity rating is based at least in part on the television programming choices of the viewer.

13. The non-transitory computer-readable storage medium as recited in claim **8**, wherein the instructions for tracking the viewer interactions of the plurality of viewers comprises instructions for tracking requests of a viewer who initiates the search request for information about the relevant television media content, and wherein the popularity rating is based at least in part on the requests of the viewer for information about the relevant television media content.

14. The non-transitory computer-readable storage medium as recited in claim **8**, wherein the popularity rating is based at least in part on television programming choices of the plurality of viewers.

15. The non-transitory computer-readable storage medium as recited in claim **8**, further comprising instructions for tracking other search requests for television programming, and wherein the popularity rating is based at least in part on the other search requests for television programming.

16. The non-transitory computer-readable storage medium as recited in claim **8**, further comprising instructions for tracking television programming that is recorded, and wherein the popularity rating is based at least in part on the television programming that is recorded.

17. The non-transitory computer-readable storage medium as recited in claim **8**, further comprising instructions for tracking information requests for television programming, and wherein the popularity rating is based at least in part on the information requests for the television programming.

18. The non-transitory computer-readable storage medium as recited in claim **8**, wherein the relevant television media content is identified based on an incorrect search term of the search request.

19. The non-transitory computer-readable storage medium as recited in claim 8, wherein the relevant television media content includes new television media content, and wherein the popularity rating is based at least in part on a projected popularity of the new television media content.

20. A method comprising:

generating popularity metadata associated with tracked television media content, wherein the popularity metadata includes at least one of searches for media content, information requests, programming choices, recordings, or new media content from a plurality of viewers;

determining popular media content relevant to at least one search term of a search request based on a popularity rating generated from the popularity metadata; and

generating for display a user interface that includes a list of the popular media content ranked according to the popularity ranking and paid placement of particular media content.

21. The method of claim 20, wherein the popularity rating is further based at least in part on the television programming choices of the plurality of viewers.

22. The method as recited in claim 20, wherein generating for display the user interface that includes the list of the popular media content ranked according to the popularity ranking comprises assigning a higher weight to television choices of a first viewer than to television choices of the plurality of viewers when ranking the relevant television media content.

23. The method as recited in claim 20, wherein the popularity rating is further based at least in part on the searches for media content included in the popularity metadata.

24. The method as recited in claim 20, wherein popularity rating is further based at least in part on the information requests included in the popularity metadata.

25. The method as recited in claim 20, wherein determining popular media content relevant to at least one search term of a search request comprises searching the popularity metadata for the at least one search term.

26. The method as recited in claim 20, wherein determining popular media content comprises identifying the popular media content based on a partial match to the at least one search term of the search request.

27. A system comprising:

a processor configured to:

generate popularity metadata associated with tracked television media content, wherein the popularity metadata includes at least one of searches for media content, information requests, programming choices, recordings, or new media content from a plurality of viewers;

determine popular media content relevant to at least one search term of a search request based on a popularity rating generated from the popularity metadata; and

generate for display a user interface that includes a list of the popular media content ranked according to the popularity ranking and paid placement of particular media content.

28. The system of claim 27, wherein the popularity rating is further based at least in part on the television programming choices of the plurality of viewers.

29. The system as recited in claim 27, wherein the processor is configured to assign a higher weight to television choices of a first viewer than to television choices of the plurality of viewers when ranking the relevant television media content.

30. The system as recited in claim 27, wherein the popularity rating is further based at least in part on the searches for media content included in the popularity metadata.

31. The system as recited in claim 27, wherein popularity rating is further based at least in part on the information requests included in the popularity metadata.

32. The system as recited in claim 27, wherein the processor is configured to determine the popular media content relevant to at least one search term of a search request by searching the popularity metadata for the at least one search term.

33. The system as recited in claim 27, wherein the processor is configured to determine the popular media content by identifying the popular media content based on a partial match to the at least one search term of the search request.

34. A system comprising:

a processor configured to:

receive a search request for television media content;

identify relevant television media content that is associated with at least one search term of the search request;

track viewer interactions of a plurality of viewers with television programming to develop a popularity rating, the viewer interactions including television programming choices of a viewer who initiates the search request; and

rank the relevant television media content based on the popularity rating, the popularity rating based at least in part on the television programming choices of the viewer.

35. The system as recited in claim 34, wherein the viewer interactions further includes television programming choices of the plurality of viewers, and wherein the popularity rating is further based at least in part on the television programming choices of the plurality of viewers.

36. The system as recited in claim 34, wherein the viewer interactions further includes television programming choices of the plurality of viewers, wherein the popularity rating is based at least in part on the television programming choices of the viewer and on the television programming choices of the plurality of viewers, and wherein the processor is configured to rank the relevant television media content by assigning a higher weight to the television choices of the viewer than to the television choices of the plurality of viewers.

37. The system as recited in claim 34, wherein the viewer interactions further includes search requests associated with the television programming, and wherein the popularity rating is further based at least in part on the search requests associated with the television programming.

38. The system as recited in claim 34, wherein the viewer interactions further includes information requests for the television programming, and wherein the popularity rating is further based at least in part on the information requests for the television programming.

39. The system as recited in claim 34, wherein the processor is configured to identify the relevant television media content by identifying the relevant television media content based on a partial match to the at least one search term of the search request.

40. The system as recited in claim 34, wherein the processor is configured to identify the relevant television media content by identifying the relevant television media content when the search request includes at least one incorrect search term.

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